

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:
IMMEDIATE

RELEASE NO: 76-01

ALSO RELEASED AT NASA HEADQUARTERS

COMPUTER AND SATELLITE CUT TIME AND COST OF WATER MAPPING

Countries that have no inventory of their water resources can obtain accurate maps of their lakes and reservoirs from satellite data at relatively small cost by using a new NASA computer program.

State agencies can use the program to make better choices between recreational and industrial use of available water supplies.

The computer program, developed at the Johnson Space Center (JSC), Houston, uses digital data from LANDSAT Earth resources survey satellites to compile maps at any desired scale showing surface water areas in excess of six acres.

Specialists in the Earth Observations Division at JSC say the new system, called the Detection and Mapping (DAM) Package, is so simple that only \$300 worth of computer time is needed to map more than 33,800 square kilometers (13,000 square miles).

Paraguay, as an example, could obtain high quality surface water maps of the entire country 408,200 sq km (157,000 sq. mi.) for less than \$10,000, including all computer and labor costs.

Since NASA's two LANDSATs cover about 95 per cent of Earth's land mass, surface water maps can be produced by this system for virtually all populated regions.

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Accuracy of the program is almost 100 per cent for areas of water 4 hectares (10 acres) and larger. Position accuracy, the degree to which the computer-produced water maps match the terrain in question, is within 90 meters (300 feet) of dead center.

The JSC scientists who developed the system explain that user training is very brief, typically as short as one day, and no computer or remote sensing experts are needed to implement the water mapping program.

The U.S. Army Corps of Engineers used the DAM Package to map water resources in Washington and Tennessee. The Texas Water Development Board has used the program for regional water mapping in Texas and regional agencies in Oklahoma have also used the program.

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EDITOR'S NOTE: Additional technical information and availability of the program for potential users can be obtained from:

Chief, Earth Observations Division
Code: TF
Johnson Space Center
Houston, TX 77058.

January 7, 1976

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

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Terry White

For Release:
January 18, 1976

RELEASE NO: 76-02

ALSO RELEASED AT NASA HEADQUARTERS

ASTRONAUT FOOD TECHNOLOGY APPLIED TO MEALS FOR ELDERLY

While three square meals a day are taken for granted by most Americans, getting even one balanced meal each day is a problem for some of the nation's elderly.

Food technology and packaging techniques developed by the NASA Johnson Space Center, Houston, to feed Apollo and Skylab crews during space flight are being applied in a pilot program to help provide balanced meals to elderly who live alone. Physicians, nutritionists and biomedical engineers at the Center are working together to design and develop a meal system to supplement the existing National Nutrition Programs for the Elderly.

The effort is part of the agency's Technology Utilization program in which space-developed technology is applied in the solution of earth-bound problems.

Project Engineer Gary R. Primeaux reported that surveys have shown that many elderly Americans do not receive adequate nutrition. He cites as contributing factors lack of single-serving products, limited mobility, loss of skills needed to prepare balanced meals, limited finances and often a sense of loneliness or rejection that reduces the incentive to cook and eat nutritious meals alone.

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Called Meal Systems for the Elderly, Primeaux says: "Its goal is to develop nutritious, shelf-stable, convenient and easily deliverable meals for the elderly."

While several programs for home-delivered hot lunches for the elderly are being tried in some cities, there is usually no weekend service and spoilage risk is high. The NASA team developing the meal system is striving to come up with a shelf-stable, multi-meal package that can be distributed by several methods--even parcel post--to senior citizens who live beyond the range of hot-meal delivery or to those people in cities where weekend meals are not provided.

The team is working toward a meal system that can be opened, cooked, eaten and cleaned up by elderly people living alone. A field demonstration, starting early this year, in which selected elderly Texans will prepare and eat developmental meals will give the team an evaluation of meal design and delivery methods.

The basic meal will consist of an entree, two side dishes, desert and beverage, with a 21-day menu cycle to provide variety from a list of 10 entrees, 20 side dishes, 10 desserts and five beverages. Each meal will provide at least one-third of the daily dietary allowance for elderly persons.

The design, development, field demonstration and evaluation phases of the program are expected to be completed by late 1976, according to Primeaux.

In addition to the JSC team developing the meal system technology, the University of Texas Lyndon B. Johnson School of Public Affairs, Austin, will assist in demonstrations and distribute meals. The Texas Research Institute of Mental Sciences, Houston, has surveyed attitudes, food preferences and has run taste tests among potential users.

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The program is expected to cost \$240,000, of which NASA will fund \$125,000; Johnson School of Public Affairs, \$90,000; Texas Research Institute of Mental Sciences, \$8,000; and United Action for the Elderly, Inc. \$17,000.

Technology, Inc. and Martin Marietta Corp. are contractors in the development program.

Photographs to illustrate this news release will be distributed without charge only to media representatives in the United States. They may be obtained by writing or phoning:

The Public Affairs Audio-Visual Office
Code FP/NASA Headquarters
Washington, DC 20546

Telephone No. 202/755-8366

Photo No: 76-H-2
76-H-3

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Jack Riley

For Release:

RELEASE NO: 76-03

January 8, 1976

JSC MANAGEMENT CHANGES

Increasing demands of the Space Shuttle Program have resulted in three management changes at the Johnson Space Center, Dr. Christopher C. Kraft, Jr., Director, announced today.

Kenneth S. Kleinknecht has been named Assistant Manager of the Orbiter Project, part of the Space Shuttle Program; George W. S. Abbey has been appointed Acting Director of Flight Operations, replacing Kleinknecht; and Henry E. Clements has been assigned as Acting Technical Assistant to Kraft, replacing Abbey.

"The growing demands of the Space Shuttle Program have increased the need for hardware and program management expertise," Kraft said. "Mr. Kleinknecht has had broad experience in program management at JSC in the Mercury, Gemini, Apollo and Skylab Programs and will add significant management expertise to the Orbiter Project."

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Abbey was assigned to the Apollo Program Office prior to becoming Kraft's technical assistant, and Clements recently returned to JSC after several years of management experience at NASA Headquarters, Washington, D.C.

The Space Shuttle is a reusable vehicle that will replace virtually all U.S. space launch vehicles. The Orbiter section will be used to deploy and retrieve satellites and serve as a carrier for Spacelab, a manned laboratory being developed by the European Space Agency.

On its return to Earth, the Orbiter will land on a runway like an airplane and then be prepared for another mission. Operational flights are scheduled to begin in 1980.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:
January 17, 1977

RELEASE NO: 76-04

JSC Combines Science Organizations

Richard S. Johnston has been named Director of Space and Life Sciences at the NASA Johnson Space Center, Houston, in a merger of two Center organizations -- the Life Sciences Directorate and the Science and Applications Directorate. The reorganization is effective immediately.

Peter J. Armitage is Assistant Director for Plans and Programs. Dr. Lawrence F. Dietlein is Assistant Director for Life Sciences, and Dr. Owen K. Garriott is Assistant Director for Science.

The new organization absorbs the five divisions in the former directorates: Science Payloads Division, Space Research and Operations Division, Bioengineering Systems Division, Earth Observations Division, and Lunar and Planetary Sciences Division.

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Johnston, 50, began his federal service in 1946, at the U.S. Naval Research Laboratory as a research chemist. He transferred to the U.S. Navy Bureau of Aeronautics (BuAer) in 1955, where he worked on aircraft liquid oxygen breathing systems and low-altitude escape systems.

Johnston transferred to the NASA Space Task Group at Langley Field, Virginia, in 1959, as an environmental control system engineer on Project Mercury, later becoming chief of the Manned Spacecraft Center (now Johnson Space Center) Crew Systems Division. He was named special assistant to the JSC director in 1968, and managed the Apollo Lunar Quarantine Program and the preparation and operation of the Lunar Receiving Laboratory.

He was appointed deputy director of JSC Medical Research and Operations in 1970, and became Director of Life Sciences in 1972. He joined the Bunker Ramo Corporation, Oak Brook, Illinois in January 1976 as special assistant to the president, but returned to JSC and federal service in the fall of 1976.

"I enjoyed my brief stay in industry," said Johnston, "but I missed JSC, its people and the broad spectrum of scientific and technical problems we encounter in the space program. The new directorate will be a challenging job for me professionally, and I feel that JSC will receive many benefits from pooling its limited resources into a stronger science organization."

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Milton E. Reim

For Release:

RELEASE NO: 76-05

January 21, 1976
Noon

AERONUTRONIC FORD CONTRACT AT JSC EXTENDED SIX MONTHS

The National Aeronautics and Space Administration has signed a Supplemental Agreement Number 201 to Contract NAS 9-1261 with Aeronutronic Ford Corporation, Space Information Systems Operation of Houston for an extension of six months to the current contract.

Direct labor hours and materials for performance of Ground Data Hardware and Software Systems engineering, implementation, maintenance and operations will be performed under the contract.

Work to be performed consists of system engineering and integration, maintenance, operations, and other support functions, such as logistics, reliability and quality assurance for the Mission Control Center (MCC) and various other ground based data systems managed by the Johnson Space Center at Houston.

Contract NAS 9-1261 is a Cost-Plus-Award-Fee contract. The additional effort valued at about \$10,690,633, brings the estimated value of Contract NAS 9-1261 to approximately \$278,400,000.

Aeronutronic Ford will perform the majority of the work at their Houston, Texas, location with support from their facilities at Willow Grove, Pennsylvania.

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Lyndon B. Johnson Space Center
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AC 713 483-5111

Robert V. Gordon

RELEASE NO: 76-06

For Release:

January 21, 1976
2 p.m.

TECHNICOLOR CONTRACT AWARDED

Technicolor Graphic Services, Inc., 1001 N. Cahuenga Boulevard, Hollywood, California 90038, has been awarded a contract for Photographic Support Services at the Lyndon B. Johnson Space Center (JSC), Houston, Texas 77058.

Technicolor will be responsible for management and operation of the motion-picture, precision, metric and still laboratories, laboratory analysis and support, and audiovisual support at JSC.

The contract will be a cost-plus-award-fee type contract and is awarded for a 1-year period beginning January 1, 1976, and ending December 31, 1976. The contractor will employ approximately 112 persons and the estimated amount of the contract is \$2,242,000.

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National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Milton E. Reim

For Release:

January 27, 1976
Noon

RELEASE NO: 76-07

SHUTTLE MISSION SIMULATOR CONTRACT AWARDED TO SINGER COMPANY

The National Aeronautics and Space Administration has awarded a letter contract to the Singer Company, Simulation Products Division, Binghamton, New York, for development of a Shuttle Mission Simulator (SMS) for use as a trainer for the Space Shuttle Orbiter Vehicle crew and flight controllers.

The SMS, to be used for training for Shuttle Orbital Flight Tests one and two, will be delivered by March 31, 1978. The modifications to the SMS required to train crews for Orbital Flight Tests three and subsequent will be delivered and installed by March 31, 1979.

Singer will design, develop, fabricate, install, and test a simulator consisting principally of a Motion Base Crew Station and a Fixed Base Crew Station, with integration of associated visual systems and computer systems.

The SMS will be used to train crews and flight controllers in all Orbiter mission phases (launch, orbital insertion, orbital operations, re-entry, and landing).

SMS work will be performed primarily in Binghamton, New York; Sunnyvale, California; and Houston, Texas. Estimated value of the program is \$28,600,900.

The work will be managed by the NASA Lyndon B. Johnson Space Center, Houston, Texas.

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National Aeronautics and
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Houston, Texas 77058
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Terry White

For Release:

RELEASE NO: 76-12

February 6, 1976

JSC HOSTS BIOPROCESSING IN SPACE COLLOQUIUM

More than 150 industrial and academic researchers will meet March 10-12, at the NASA Johnson Space Center, Houston, to examine potentials of processing biological materials in space flight.

The Colloquium on Bioprocessing in Space will be held at the JSC Gilruth Recreation Facility to acquaint researchers in the pharmaceutical, biomedical and biological fields with the opportunities to fly bioprocessing experiments aboard Spacelab in the 1980's. Spacelab is a manned space station being built by a consortium of 10 European countries which will be carried into Earth orbit in the cargo bay of the Space Shuttle Orbiter.

Space processing experiments flown in Apollo, Skylab and Apollo-Soyuz---last summer's joint manned flight with the Soviet



Union---revealed that many materials exhibit unique characteristics in the weightlessness of space flight.

Electrophoresis experiments on Apollo-Soyuz have shown promise as possible means of separating human kidney cells capable of producing an enzyme, urokinase, for treating blood-clotting disorders and in isolating white blood cells needed for leukemia patient transfusions.

The JSC Colloquium will cover the technical details of biomedical material behavior in weightlessness, a description of Spacelab and Space Shuttle research facilities and flight opportunities, results of biological experiments already conducted, and a survey of potential research and industrial space applications.

The agenda for Monday, March 10, includes presentations on the following topics: Space Shuttle and Life Sciences; Spacelab; NASA's Space Processing Program; Working in Space; Materials Behavior in Space; and Space Processing on Skylab and Apollo-Soyuz.

On the March 11 agenda are: Cell Experiments in Zero-g; Gravity Sensors in Cells; Bioprocessing/Biological Separations; and Biosynthesis Using Tissue Culture and Fermentation Techniques; followed by workshop meetings on Biotechnology, Cell Biology, Biosynthesis, and Pharmaceuticals.

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Researchers wishing to register for the Colloquium or to receive the published proceedings should contact Dr. Dennis R. Morrison/DF2, NASA Johnson Space Center, Houston, TX 77058, telephone 713/483-2031.

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National Aeronautics and
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Lyndon B. Johnson Space Center

Houston, Texas 77058

AC 713 483-5111

Robert Gordon

For Release:

February 12, 1976

RELEASE NO: 76-12

NORTHROP CONTRACT EXTENSION

The National Aeronautics and Space Administration has signed a \$8.8 million, one-year, contract extension with Northrop Services, Inc., Houston, Texas, for operations and maintenance of laboratory and test facilities at the NASA Johnson Space Center.

This extension brings the estimated value of the contract to \$37, 146, 742. Northrop has been providing operation and maintenance services to the NASA Johnson Space Center for the past three years.

The work to be performed will consist of maintenance and operation of life sciences and engineering laboratories and the lunar curatorial laboratory. A total of 425 people are employed under this contract.

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National Aeronautics and
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Charles Redmond

For Release

RELEASE NO: 76-13

UPON RECEIPT
Feb. 10, 1976

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All 18 Jan

APOLLO 14 ALSEP FAILS

After 4 years, 11 months and 13 days of continuous data transmission, the Apollo 14 lunar scientific experiments package, ALSEP, failed. The station was originally set up on February 5, 1971, by Alan B. Shepard and Edgar D. Mitchell, during the third manned exploration of the moon. The transmitter failed on January 18, 1976, ending the Apollo 14 ALSEPs long transmission history.

The Apollo 14 ALSEP, one of five stations on the moon, was essential in providing scientists a lunar seismic network. With the Apollo 12 station and stations at Apollo sites 15 and 16 subsequently installed, the ALSEP 14 station provided geophysicists necessary data to locate moonquakes and begin the study of the moon's interior structure.

Originally designed for a life of one year, the ALSEP 14 has long outlived its specifications. It is the first of the ALSEPs to fail completely although it has had problems before. Almost one year ago, in March 1975, the ability of the station to receive commands from Earth was lost and never regained. However, in the meantime the 14 station continued to transmit data about the moon's seismic activity.

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ALSEP engineers at the Johnson Space Center believe that the most likely cause of the failure is an electronic component which quit functioning. A small chance remains that the failure was due to thermal stress as the instruments underwent dramatic temperature changes. The temperature excursions occur every time the moon undergoes sunrise or sunset. Maximum temperatures reach 227 degrees C and fall to minus 170 degrees C. The ALSEP stations have gone through temperature changes of as much as 400 degrees C in less than two hours.

The four remaining ALSEP stations continue to provide lunar scientists with data concerning the moon's seismic activity, heat flow, interactions with the Earth's magnetic field, the solar wind and cosmic particles which continuously bombard the moon's surface.

The contribution of the ALSEP stations to lunar science is substantial. Larry Haskin, chief of the planetary and earth sciences division at the Johnson Space Center says "most of what we know about the interior of the moon has come from these packages." A partial list of important findings based on ALSEP data includes:

- * The existence of moonquakes, several thousand a year with most of them about 4 on the Richter scale.
- * Indications of a lunar core at or near the melting point.
- * A thick lithosphere that has probably precluded mountain-building on the moon.
- * A tenuous atmosphere on the moon's surface deriving from solar wind particles.

The ALSEPs are the most sophisticated sensors which will be established on a planet's surface, besides the Earth, for the foreseeable future. The seismic instruments at the ALSEP stations are the most sensitive of any in existence.

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The data returned by the ALSEPs has laid much of the groundwork for the orbital studies of planets.

The Apollo 12, 15, 16 and 17 ALSEPs have an estimated life of three years remaining. Apollo 12 ALSEP was activated in November 1969, and has four of its six original experiments still working. Apollo 15 ALSEP activated in July 1971, has five of its original eight experiments functioning. Apollo 16 ALSEP, activated in April 1972, has three of its original four experiments still active. Apollo 17 ALSEP, the last station established on the moon, was activated in December 1972, and has four of its original five experiments still functioning.

The ALSEP stations, which are powered by small nuclear reactors, were designed and built by the Bendix Corporation, Aerospace Systems Division, Ann Arbor, Michigan.

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February 10, 1976

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert V. Gordon

For Release:

February 12, 1976

RELEASE NO: 76-14

DRAPER LABORATORIES CONTRACT EXTENSION

The National Aeronautics and Space Administration has awarded a \$6.8 million, two-year contract extension to the Charles Stark Draper Laboratories of Cambridge, Massachusetts, for the technical support of Space Shuttle Orbiter avionics software development.

Under the terms of the contract, the Draper Laboratories will provide the computer programming relative to the integration of the guidance, navigation, and control systems of the Space Shuttle Orbiter, the reusable space system scheduled to be launched in early 1979. This effort, which will employ approximately 55 people at the Draper facilities in Cambridge, Mass., shall include software design, design verification, simulation, requirements formulation, and analysis for the Orbiter avionics as required for the guidance, navigation and control computer programming.

The Draper Labs have been furnishing this support to the Johnson Space Center since 1974.

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NASA News

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Charles Redmond

For Release:

February 22, 1976

RELEASE NO: 76-15

ALSO RELEASED AT NASA HEADQUARTERS

SEVENTH LUNAR SCIENCE CONFERENCE TO INCLUDE PLANETS

Discoveries made about the Moon will be applied to deciphering the origin and early history of the solar system when several hundred scientists gather in Houston next month for the Seventh Lunar Science Conference.

The conference will be at NASA's Johnson Space Center on March 15-19.

A new topic, "Earliest History of the Moon and Solar System" will be introduced, in which scientists will use data obtained from lunar rocks to understand what Earth and the other planets were like between the time that the solar system formed about 4.6 billion years ago and about 3.7 billion years ago, the age of the oldest rocks preserved on Earth.

The fact that moon rocks are beginning to tell us something about other planets is one of the most exciting aspects of current lunar research, according to the conference cochairmen, Dr. Larry A. Haskin, JSC Chief of Planetary and Earth Sciences, and Dr. Robert O. Pepin, Director of the Lunar Sciences Institute. Bodies like the Moon, Mars, and Mercury have apparently formed in much the same way, and their early histories are dominated by the impacts of large bodies and by widespread melting within them.

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The Moon preserves some of the details of these processes, and several scientists at the conference will describe how lunar data can be used to interpret the craters and volcanoes recently photographed by robot spacecraft on the surfaces of Mercury and Mars. Other papers will discuss meteorites, the satellites of Jupiter (which are about the size of our own Moon), and the use of Earth-based telescopes to measure the chemical composition of the asteroids.

Despite the changing emphasis in lunar studies, many features about the Moon itself are still not understood. Controversy persists about why the lunar surface is magnetic, whether the Moon has an iron core, what the inside of the Moon is made of, and what kinds of chemical separations occurred when the Moon was young. If we can answer these questions for the Moon, we may be able to answer them for other planets, including Earth.

This year's emphasis on more general planetary studies is a new trend for the Lunar Science Conferences, which have been held annually since 1970, when the first conference assembled to hear about the scientific results from the Apollo 11 mission, the first manned landing on the Moon. The conference brings together scientists in such diverse fields as geology, chemistry, physics, astronomy, engineering, and biology. More than 700 scientists from as far away as Australia attended last year's conference.

The conference begins on Monday, March 15, with three simultaneous sessions and continues through Friday. Sessions will be held in the JSC Main Auditorium and in the JSC Gilruth Recreation Center. The conference topics are:

Constraints on Structure and Composition of Planetary Interiors;

Characteristics and Movements of Materials on Lunar, Planetary and Asteroidal Surfaces;

Characterization and Evolution of Maria and other Volcanic Landforms;

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Characterization and Evolution of Planetary Crusts;

Nature and Effects of Impact Processes;

Extraterrestrial Materials as Solar/Interplanetary/Interstellar
Probes; and

Earliest History of the Moon and Solar System.

The Lunar Science Conferences are sponsored jointly by the Johnson Space Center and the Lunar Science Institute, Houston. Proceedings of the first six conferences fill 18 thick volumes and are supplemented by material published in many scientific journals.

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February 13, 1976

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Houston, Texas 77058
AC 713 483-5111

Charles R. Redmond

For Release:

ALSO RELEASED AT NASA HEADQUARTERS

February 23, 1976

RELEASE NO: 76-17

APOLLO 14 ALSEP EXPERIENCES SHORT-LIVED DEATH

"Reports of my death are greatly exaggerated."

Mark Twain

On January 18, 1976, an untimely and unexplained occurrence ended the performance of one of five remote scientific stations transmitting data from the moon.

Scientists and engineers at the Johnson Space Center, Houston, were disappointed and puzzled. The station was almost five years old and had an estimated life remaining of from two to three years. Alan B. Shepard and Edgar D. Mitchell had established the station during their visit to the moon on Apollo 14 in February 1971. Other stations, from Apollo 12, which was older, and Apollo's 15, 16 and 17 were still performing admirably. There was no data to indicate the Apollo 14 station was headed for extinction. Although, last March 1975, the 14 station did lose its receiver rendering ground controls useless.

When the transmitter failed last month it left JSC scientists and Bendix engineers, who designed the stations, perplexed. They are even more perplexed now, though. On February 19, the Apollo 14 ALSEP (Apollo Lunar Scientific Experiment Package) returned to life with its transmitter, receiver and experiments functioning extremely well.



In fact, for one of the experiments, the 14 station appears to be performing better than it ever has. The Charged Particle Lunar Environment Experiment (CPLEE) had not been able to perform during the lunar daytime due to temperature excursions which degraded the power supply. The CPLEE is now performing during lunar daytime and sending good data.

The ALSEP team at the Johnson Space Center at present has no idea of why the station came back on. It may have been a relay in the power system which had been stuck, ending the transmissions, and became unstuck. The ALSEP engineers are proceeding slowly in their trouble-shooting out of caution for overloading the station with too many commands. Extreme temperature excursions, as much as 400 degrees F in two hours, were cited as a possible cause for the cessation last month.

The estimated remaining life of the 14 station is from 2 to 3 years, depending on degradation of the power supply. Although originally designed to operate for only one year, the stations have performed remarkably well, with the oldest station, the Apollo 12 ALSEP, now going on its seventh year.

Although not all of the experiments at each station are working, the majority of the experiments still continue to provide earth-based geoscientists with invaluable information on the moon's thin solar atmosphere, conditions within the moon and moonquakes.

A few of the important findings which have resulted from studies of data received from the 5 remote stations includes:

- * The existence of moonquakes, several thousand a year with most of them less than 4 on the Richter scale.
- * Indications of a lunar core at or near the melting point.
- * A thick lithosphere (crust) which has probably precluded mountain-building on the moon.
- * A tenuous atmosphere on the moon's surface deriving from solar wind particles.

The significance of the renewed activity from the 14 station lies with the station's Passive Seismic Experiment. The 14 station, along with stations set up during Apollo's 12, 15 and 16, provides a network enabling scientists to track and pinpoint moonquakes. It is these moonquakes, together with impacts by large meteorites, which have given scientists their first look at the moon's interior. Studies of the moon's interior now rank among the most important considerations. Geoscientists have been long awaiting a large impact which would send seismic signals through the moon's core to the seismic stations on the near side. Such a large impact has not yet occurred leaving scientists still unsure whether the moon's core is molten, semi-molten or even metallic.

With Apollo 14 ALSEP now on line again, scientists will be better able to interpret that long-awaited for impact, should it come.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton E. Reim

RELEASE NO: 76-17

For Release:

February 24, 1976
1 p.m.

SPACE SHUTTLE APPROACH AND LANDING TEST CREWS NAMED

The National Aeronautics and Space Administration today announced crews for the Space Shuttle Approach and Landing Test (ALT), the initial flight test of the Shuttle Program. The ALT tests are scheduled to begin in mid-1977.

Two 2-man crews were named. They are: Fred W. Haise, Jr., commander and Charles G. Fullerton, pilot; Joe H. Engle, commander and Richard H. Truly, pilot. Both crews are scheduled to fly ALT missions with Haise and Fullerton making the first flight.

The ALT flights will be conducted at the NASA Dryden Flight Research Center in California. The Orbiter will be carried aloft to an altitude of about 25,000 feet atop a specially modified 747 aircraft. It will then be released allowing the crew to fly the Orbiter to the ground. Several unmanned and manned non-release flights will precede the initial "free flight" of the Orbiter.

The crews will participate in the various phases of Orbiter test and checkout between now and the first flight. Both crews will train for the flights utilizing the NASA T-38 aircraft with special speed brake; the Shuttle Training Aircraft, a modified twin jet Gulfstream II; Shuttle Procedures Simulator and the Orbiter Aeroflight Simulator.

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Haise, 43 (civilian), commander of the first crew was selected for the astronaut program in April 1966. He was backup lunar module pilot for Apollos 8 and 11, lunar module pilot on Apollo 13 and backup commander on Apollo 16. He is the only crewman named that has flown in space.

Fullerton, 40 (Lieutenant Colonel, USAF), pilot of the first crew was one of the USAF Manned Orbiting Laboratory Program crewmen selected for the astronaut program in September 1969. He was a member of the support crews for the Apollo 14 and 17 missions.

Engle, 44 (Colonel, USAF), commander of the second crew was selected for the astronaut program in April 1966. He was a member of the astronaut support crew for Apollo 10 and the backup lunar module pilot for the Apollo 14 mission.

Truly, 39 (Commander, USN), pilot for the second crew was one of the USAF Manned Orbiting Laboratory Program crewmen selected for the astronaut program in September 1969. He was a member of the support crew for all three manned Skylab missions.

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National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert V. Gordon

For Release:

RELEASE NO: 76-19

March 5, 1976
2:00 p.m. CDT

ALSO RELEASED AT NASA HEADQUARTERS

TWO FIRMS WILL STUDY SPACE STATION SYSTEMS

Grumman Aerospace Corporation, Bethpage, New York, and McDonnell Douglas Astronautics Co., Huntington Beach, California, were selected today for negotiation of fixed price contracts to conduct parallel space station systems analysis studies for NASA.

Each 18-month study will cost approximately \$700,000. The Grumman study will be managed by the NASA Marshall Space Flight Center, Huntsville, Alabama. The NASA Johnson Space Center, Houston, Texas, will manage the McDonnell Douglas study. The work is to begin April 1.

The contractors are to define and analyze concepts of space station facilities for low and synchronous altitude Earth orbit including orbit-to-orbit transportation. Emphasis is to be placed on assuring a space station of modular construction with growth potential over a number of years.

The space station would be designed to serve as an operational base in space and also a space laboratory.

As an operational base the space station could serve as a test and construction facility to support the manufacturing, fabrication, and assembly of large space structures which may be required for a variety of earth benefits from space. Other

- more -



uses as an operational base may include retrieval and repair of spacecraft and serving as an orbital propellant depot to refuel transfer systems carrying payloads from low to high Earth orbit or to an escape orbit.

Serving as a space laboratory, the space station could accomodate materials processing, research and development leading to commercial manufacturing, basic and applied physical sciences experiments, space physics and astronomy missions, life sciences research and for continued development of sensor technology in areas such as Earth surveys, navigation, weather and climate research.

Proposals on the studies were also received from the Rockwell International Space Division, Downey, California, and Boeing Aerospace Company, Seattle, Washington.

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Robert V. Gordon

For Release:
March 24, 1976

RELEASE NO: 76-21

ALSO RELEASED AT NASA HEADQUARTERS

SHUTTLE SPACE SUIT AND RESCUE SYSTEM

Space travelers of the 1980's who will fly aboard the National Aeronautics and Space Administration's Space Shuttle Orbiter will be furnished with a unique space suit and rescue system.

Engineers at the NASA Johnson Space Center, Houston, Texas, are currently developing a new space suit concept and rescue system for use by astronauts and scientists aboard the Space Shuttle.

Design for the Shuttle suit features an "adjustable fit" concept, a departure from the Apollo program in which suits were customized for each astronaut, a long and costly process. It is anticipated that the Shuttle suit, a two piece combination of upper and lower torso, will be manufactured in small, medium and large sizes to accommodate the total astronaut population, including females. Each size can then be individually adjusted for astronaut preference.

When the Space Shuttle becomes operational in 1980 with the capability to conduct as many as 60 missions a year, the Pilot and Mission Specialist will be outfitted with the space suit while the Commander and Payload Specialists will each be provided with a personal rescue system.

- more -



In the event an orbiter becomes disabled and is unable to return to earth, a rescue orbiter will be launched to transfer astronauts and passengers from the marooned craft.

The Personal Rescue Enclosure is a 34-inch diameter ball which contains its own short term simplified life support and communication systems. The ball which was conceived and fabricated by members of the Crew Systems Division at the Johnson Space Center, has three layers (Urethane, Kevlar and an outside thermal protective layer) and a small viewing port of tough Lexan.

Three modes of transfer from one vehicle to another are now being studied by NASA engineers at JSC. One is for a spacesuited astronaut to carry the rescue balls, much like a suit case, from one vehicle to the other. A second mode is to hook up a clothes-line like device between the two spaceships and pass the rescue ball with its passenger from the disabled spaceship to the rescue ship. A third method could be to use the remote manipulator arm in the cargo bay of the orbiter to pluck the rescue ball and its passenger from the disabled spaceship and place it aboard the rescue ship.

The new space suit conceived by suit engineers of JSC's Crew Systems Division, provides a modular construction (upper and lower torso) with a body seal closure at the waist. This eliminates the need for pressure-sealing zippers used in Apollo and Skylab suits and is expected to form a much more reliable ensemble.

Materials used in the Shuttle suit, the same as used in the rescue ball, provide a much longer shelf life, according to suit technicians who have run extensive pressure and abrasion tests on the new materials.

Use of the new, strong and durable Kevlar fabric has permitted technicians to fabricate joints (elbow, wrist, knee, etc.) from the flat fabric rather than following the Apollo and Skylab suit pattern where joints were constructed of molded neoprene rubber convolutes with cables. The fabric joints provide better mobility and, more importantly, reduce the cost and weight of each suit.

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Another feature of the Shuttle suit is the integral portable life support system. When Apollo astronauts walked on the moon they had to first remove a bulky 75 pound life support system from its storage location and then connect it to the suit. The Shuttle suit contains a life support system which is an integral part of the rigid upper torso.

- end -

PHOTOS AVAILABLE UPON REQUEST

NASA-JSC

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Milton Reim

For Release:

April 13, 1976

RELEASE NO: 76-24

VISUAL LANDING MODEL FOR SHUTTLE BEING READIED AT JSC

Before NASA Space Shuttle pilots make their first flight in the Orbiter, they will make their first landing attempts on a 56 by 24 ft. (17.07 by 7.32 meters) visual model of the Edwards Air Force Base, CA, runways and surrounding terrain.

The Orbiter is the United States' new low-cost transportation system designed to carry into earth orbit a crew including scientific and technical personnel and payloads, then return to earth and land much like a conventional jet airliner on an airport runway.

The visual model which will be used for these practice landings was constructed in a model-maker's shop in Kinston/Surrey, England. The model arrived recently at the Johnson Space Center in 42 sections.

Assembly of the model is scheduled for next month in the JSC Building 5 Mission Training and Simulation simulator facility. The sections will be assembled vertically on a structure near a wall and become an integral part of the Orbiter Aeroflight Simulator being constructed for NASA by the Singer Company, Simulator Products Division.

Opposite the model will be a battery of 264 1000-watt metal-halide arc lamps to light the Edwards AFB model, simulating daylight conditions.

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The model sections are constructed of reinforced fiberglass and aluminum. Each section is 4 x 8 feet (1.2 by 2.4 meters) and weighs about 150 pounds (67.5 kg.).

John Piper Ltd., a specialized model making firm located southwest of London, constructed the model based upon aerial and ground photographs, contour maps and first-hand impressions of the area by Piper while on a tour of Edwards AFB last year.

To transmit a pilot's eye-view of the landing site to the windows of the Space Shuttle Orbiter simulator, a special 126 degree optical probe built by Farrand Optical will be utilized. The optical system consists of the optical probe, mirrors, beam splitters and three color television cameras especially designed by Singer. The optical system is mounted on a twin tower gantry permitting the unit to move in all directions. The movements of the optical probe are correlated to the pilot's hand controller in the Orbiter cockpit.

The model provides the Orbiter pilot with a true representation of the colors and the terrain around Edwards AFB. To the eye, the model colors may seem slightly exaggerated, but when the image passes through the TV optical system, the colors match what a pilot will see from the Orbiter cockpit when making a landing approach over the actual site. The horizon and sky viewed by the pilot in the Orbiter simulator is provided by a visual effects generator. The horizon movement accurately tracks the terrain movements.

The view presented in the Orbiter windows covers a horizontal field of view of 120 degrees. At any one time any four of the six Orbiter windows in sequence will depict the view of the landing site. The view can be provided for optimum viewing at either the commander's (left seat) or the pilots side of the cockpit.

The model represents a rectangular area of about 8 1/2 by 20 nautical miles (15.75 x 37 km.) on a northeast by southwest line. The scale is 1 to 2145.

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Edwards AFB runways 17 and 22/4 are depicted on the model along with local landmarks and terrain. Runway 17 crosses a salt flat and is about seven nautical miles (13.0 km.) in length and is lined off with four broad asphalt stripes. Runway 22/4 is concrete, 15,000 feet long (4572 meters) with 1700 feet (518 meters) asphalt overruns on each end. Runway 17 will be primary for the Approach and Landing Test Flights of the Shuttle Orbiter scheduled for mid 1977.

- end -

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Milton E. Reim

For Release:
April 9, 1976

RELEASE NO: 76-25

PAN AMERICAN WORLD AIRWAYS JSC SUPPORT CONTRACT EXTENDED

Pan American World Airways, Inc., Aerospace Services Division, Cocoa Beach, Florida, has been awarded a 1-year extension to their present contract for Plant Maintenance and Operations Support Services at the Lyndon B. Johnson Space Center (JSC), Houston, Texas.

Pan American is responsible for the operation of all utility systems and maintenance of utilities, buildings, roads, ditches, and special equipment at JSC.

The contract is a cost-plus-award-fee type contract. Pan American was selected for award of this contract for an initial 1-year period beginning February 13, 1974, and ending February 12, 1975, with two additional 1-year extension periods.

This present award represents the second of the two planned extensions and extends the contract period through February 12, 1977. The contractor employs approximately 310 persons, and the annual estimated amount of the contract is \$7.4 million.

- end -



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Charles Redmond

For Release:
May 14, 1976

RELEASE NO: 76-28

JUNIOR HIGH STUDENTS TO BENEFIT FROM UNUSUAL EDUCATIONAL PROGRAM

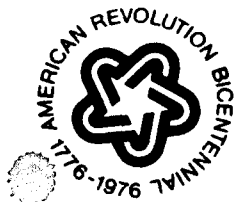
The 465 students at South Charleston Junior High School, West Virginia, are in for an exceptional educational experience on May 27. On that Thursday the school will host Dr. Michael Duke, Lunar Sample Curator from the Johnson Space Center, Houston, and lunar sample material collected during the Apollo explorations on the moon.

South Charleston Junior High students and educators will get a firsthand look at results of extensive analysis on the samples and an explanation from Dr. Duke of the moon's history, how the moon and the earth fit into the solar system, and opportunities to discuss the lunar and planetary exploration programs of NASA.

The junior high school was not selected by the agency for this program, rather a student from the school, 15-year-old David Simpson, was chosen as first prizewinner in an essay contest -- the prize for which was Dr. Duke and the chance to view lunar material in the school.

The essay contest was sponsored by the secondary school magazine Current Science and asked students to answer the question "How Should the United States Continue Its Space Exploration Program?" Current Science is published by Xerox Education publications.

- more -



This will be the first time such a program has been scheduled at a secondary school. It will also be the first time lunar material has been used in a secondary school as part of an instructional program.

David's prize winning essay encouraged continued exploration of the solar system using unmanned probes. He said, "I believe that the United States should continue its efforts in space exploration largely through the use of unmanned probes...International cooperation would be an important factor in such an endeavor. Several nations contributing to a project would considerably reduce the expense for any one nation, and the combined technologies pave the way for larger and more ambitious projects...Such international cooperation would help promote world peace. And once world peace is established, a large portion of government funds could be turned over to space exploration, as a great deal of technology is derived from this field. Such technology could be put to use not only in the exploration of space, but also into other important (areas) such as disease, starvation, and ignorance. Thus, through the exploration of space, man can not only solve serious problems at home, but can learn more about the heavens which have intrigued him since the beginning of history."

The contest drew over 3,000 entries from students across the U.S. and Canada. Contest rules and an article explaining the objectives of the essays were published in a Xerox magazine Current Science distributed to secondary schools. The winning essay was independently chosen from 20 semi-finalists by both Dr. Duke and editors of Current Science.

David Porterfield, vice-principal for South Charleston Junior High, said that the entire school was "excited" over the prospects of the presentation. "We've had visits from industry and other programs

- more -

for the students in the past, but this will be a new experience for us. We're very excited about it," he said.

David Simpson, the essay winner, is also excited about the visit from Dr. Duke and felt that more programs of this nature would help explain some of NASA's scientific objectives to students. David said he plans a career in a science, although he is not sure which field at the moment.

Dr. Duke's presentation will take special note of the rapid development of the space agency's interplanetary explorations, which to date have ranged to Jupiter and beyond and which this July will include a Viking biological package landing on Mars, the Red Planet.

Dr. Duke and his curatorial staff believe there are broad opportunities for presentations of this nature. Duke considers the South Charleston Junior High visit a prototype program and feels programs of this nature are needed in the secondary schools across the nation.

Presently the curatorial staff has educational packages available for college-level instruction. The packages use thin-section microscope slides of lunar material and a suggested course outline for use of the slides in petrology classes.

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EDITORS' NOTE:

The complete transcript of David Simpson's winning essay is included in this release.

An Essay Concerning Space Exploration

"I believe that the United States should continue its efforts in space exploration largely through the use of unmanned probes. The Skylab vehicle could be enlarged and modified to hold a launch platform, and could be serviced by the Space Shuttle which would transport crew and cargo back and forth from earth. Thus, a probe could be readied on the ground, transported to Skylab via the Space Shuttle, and launched from a launching platform on Skylab.

Sending probes to investigate Saturn's rings, the surfaces of the superior planets, and possibly landing a probe on Pluto would prove most interesting. A vehicle sent to the asteroid belt could bring back very small asteroids for study and analysis. And perhaps, if technology and funds permit, a probe could be sent to investigate a close-passing comet.

International cooperation would be an important factor in such an endeavor. Several nations contributing to a project would considerably reduce the expense for any one nation, and the combined technologies would pave the way for larger and more ambitious projects. During a mission, some universal language such as Interlingua would be spoken.

Such international cooperation would help promote world peace. And once world peace is established, a large portion of government funds could be turned over to space exploration, as a great deal of technology is derived from this field. Such technology could be put to use not only in the exploration of space, but also into other important problems such as disease, starvation, and ignorance.

Thus, through the exploration of space, man can not only solve serious problems at home, but can also learn more about the heavens which have intrigued him since the beginning of history."

David Simpson
987 Harmony Lane
South Charleston, WV 25303

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Robert V. Gordon

For Release:
May 7, 1976

RELEASE NO: 76-29

METRO AWARDED LOGISTICS CONTRACT

Metro Contract Services, Inc. of Houston, Texas, has been awarded a \$1.3 million contract to furnish logistic support at the NASA Johnson Space Center.

Metro, which will employ approximately 123 persons on the contract, will be responsible for management and operation of JSC's logistics support services which include transportation services, packing and shipping, identification and cataloging, and receipt and inspection of property. Metro will also be responsible for warehouse operation, operation of a temporary storage program, and logistics plans and analysis.

The contract, which is a cost-plus-fee-award, became effective on May 1, 1976, and will run through April 30, 1977.

- end -



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Milton Reim

RELEASE NO : 76-30

ALSO RELEASED AT NASA HEADQUARTERS

For Release:
2 p.m. CDT, MONDAY,
May 10, 1976

NASA SELECTS TWO COMPANIES FOR SIMULATOR CONTRACT NEGOTIATIONS

NASA has selected the McDonnell Douglas Corp., Technical Services Co., Inc., St. Louis, Mo., and the Singer Co., Simulations Products Div., Binghamton, N.Y., for parallel negotiations leading to the award of a contract with one of the companies for maintenance, modification and operational support of the simulator training complex at the Lyndon B. Johnson Space Center, Houston, Texas. These simulators will be used for flight crew training for the Space Shuttle program.

The training complex will initially consist of the Shuttle Procedures Simulator (SPS) and the Crew Procedures Evaluation Simulator (CPES). The Orbiter Aeroflight Simulator (OAS) will be added to the training complex early in the contract period followed by the Shuttle Mission Simulator (SMS).

The initial two-year contract period will date from July 1, 1976, and the contract will provide for two additional optional performance periods of 24 months and six months, respectively.

- more -



The work to be performed includes systems and hardware engineering, software development, drafting and illustration, configuration control, installation and testing of modifications to update simulation equipment to configurations compatible with NASA requirements. Also required is the maintenance, servicing and operational support of the equipment, plus other miscellaneous tasks such as documentation and logistics support.

The Management and Technical Services Co., General Electric, Daytona Beach, Fla., and Computer Sciences Corp., Applied Technology Div., Falls Church, Va., also submitted proposals.

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Charles Redmond

RELEASE NO: 76-31

For Release:

Upon Receipt

SERV-AIR CONTRACT EXTENDED

NASA Johnson Space Center has awarded an 8-month extension to an existing contract to Serv-Air, Inc., Division of E-Systems, Inc. for continuation of maintenance and modification of aircraft assigned to JSC.

The 8-month extension of the cost-plus-award-fee-contract was for \$3.04 million and brings the total estimated contract value to \$12.61 million.

The aircraft involved are earth resources survey aircraft and air proficiency training craft flown by astronauts. The contract covers ground support in addition to engineering, design, fabrication and installation of electronic and mechanical systems and related logistic functions.

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May 10, 1976



NASA-JSC

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AC 713 483-5111

Terry White

For Release:

RELEASE NO : 76-32

May 21, 1976

JSC ENGINEER NAMED TO INDIAN ENGINEERING SOCIETY BOARD

Jerry Elliott of the NASA Johnson Space Center Space Shuttle Program Office was named to the board of directors of the National Society of American Indian Engineers at the Society's April 15 incorporation meeting. Elliott is a member of the Osage tribe.

Also named to the NSAIE Board of Directors were Cherokee George Thomas of the University of Oklahoma, and Kickapoo Robert Vermillion, an aeronautical engineer with General Electric Company in Los Angeles.

The NSAIE was formed with the goal of increasing the number of Indian engineers through supporting and improving education programs and opportunities. It is estimated that there are less than 1500 Indian engineers in the nation---about one tenth of one percent of all U.S. engineers.

Indian engineers interested in joining NSAIE should write to George Thomas, Director of Indian Programs, Oklahoma University College of Engineering, 202 West Boyd Street, Norman, OK 73109.

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Milton Reim

RELEASE NO : 76-33

For Release:

May 17, 1976

ASTRONAUT PAUL WEITZ TO RETIRE FROM U.S. NAVY, REMAIN WITH NASA

Astronaut Paul J. Weitz, Captain U.S. Navy, will retire from military service on June 1, 1976, and remain with NASA as a civilian in his present job.

Retiring after 22 years U.S. Navy service, Weitz is one of the 19 astronauts selected by NASA in April 1966. He is currently working on payloads and flight crew documentation for the Space Shuttle program.

Weitz was pilot on Skylab 2, the first manned mission, a 28-day flight from May 25-June 22, 1973. Accompanied by Charles Conrad, Jr., spacecraft commander and Joseph P. Kerwin, science pilot, the three crewmen were able to save the Skylab by erecting a "parasol" shade alleviating a thermal problem caused by the loss of the micrometeoroid shield during Skylab 1 launch.

They were also able to deploy a jammed solar power wing to assure sufficient electrical power to successfully conduct their mission and two follow-on missions of 59 and 84 days respectively.

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Jack Riley

For Release:

May 14, 1976

RELEASE NO: 76-34

JSC SELECTS PAN AM FOR SUPPORT CONTRACT NEGOTIATIONS

Pan American World Airways, Inc., Aerospace Services Division, Cocoa Beach, FL, has been selected for negotiation leading to award of a contract for engineering support services at the Lyndon B. Johnson Space Center (JSC), Houston, TX.

Pan American will be responsible for providing engineering design support for facilities and test programs at JSC.

The contract will be a cost-plus-award-fee type contract and is to be awarded for a 1-year period beginning June 1, 1976, and ending on May 30, 1977. The contractor will employ approximately 69 persons and the amount of the contract is expected to be approximately \$1.15 million.

- end -



NASA-JSC

NASA News

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Robert V. Gordon

For Release:

May 18, 1976

RELEASE NO: 76-35

ALSO RELEASED AT NASA HEADQUARTERS

SPACE SHUTTLE LANDING SYSTEM COMPONENTS DELIVERED TO NASA

The first ground-based components of the Space Shuttle Microwave Scanning Beam Landing System (MSBLS) have been shipped from Cutler Hammer's AIL Division, Dear Park, NY.

This equipment, in conjunction with other components installed in the Shuttle orbiter (also designed and built by AIL), will provide data during the final approach and landing phase of every Shuttle mission to precisely guide the orbiter to a safe landing on the runway.

The MSBLS ground-based equipment will be installed on a runway at NASA's Dryden Flight Research Center, California, where initial flight tests of the Space Shuttle orbiter are scheduled to begin in mid-1977. At that time, the orbiter will be carried aloft to an altitude of about 7,620 meters (25,000 feet) atop a specially modified 747 aircraft and will be released with the crew flying the orbiter to the ground.

A second MSBLS will be installed on the newly constructed runway at the Kennedy Space Center, Florida, where the initial orbital Space Shuttle missions will be launched in 1979. Both locations will be equipped for approach from either direction and each landing system will be fully redundant. A comprehensive monitoring system with automatic switchover is included in each installation, along with an uninterruptible power supply.



RELEASE NO: 76-35

The Shuttle orbiter will descend in a glide which begins at a very steep angle that gradually moderates, or flares, to make the touchdown soft. To fly such a path precisely, the onboard computers actually direct the aircraft through commands to the control surfaces. The computer must know precisely where the aircraft is at every instant throughout the landing. The standard instrument landing system (ILS) electronic beam cannot do this; consequently, a type of electronic beam created by the MSBLS is required. This type of system provides a total field of positions throughout all the possible approach paths the orbiter can take, instead of providing just a single straight path for the vehicle to follow.

The scanning beam feature of this system provides a flat, wide beam that sweeps across the landing sector. Pulses from the ground transmitter carry a code that identifies the exact angle at which the beam is pointing at each instant of its sweep. In the Space Shuttle, a receiver picks up these pulses and decodes them to determine the track on which it is flying.

The computer aboard the Shuttle can compare with great accuracy the exact location of the Shuttle with the desired location. If there is a discrepancy, the flight path is corrected automatically. The MSBLS provides this positional guidance with a degree of accuracy never before available in a landing system.

- end -

NASA News

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Milt Reim

For Release:

RELEASE NO: 76-37

June 2, 1976
2 p.m. CDT

ALSO RELEASED AT NASA HEADQUARTERS

IBM AWARDED SHUTTLE DATA PROCESSING COMPLEX CONTRACT

NASA has selected the IBM Corp., Gaithersburg, Md., for award of a contract to supply the Space Shuttle Data Processing Complex for the Mission Control Center at the Johnson Space Center, Houston, Texas. The estimated cost is approximately \$24 million.

The complex will consist of three computers and their peripheral equipment to be used in the Mission Control Center in support of the Space Shuttle program. The work to be performed includes the design, fabrication, delivery, installation and checkout of the computer complex and associated software.

A cost-plus-award-fee contract with major fixed price elements is contemplated. The term of the contract will be for 44 months.

Control Data Corp., Minneapolis, Minn., also submitted a proposal.

- end -



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Milton Reim

For Release:

June 8, 1976

RELEASE NO: 76-38

SHUTTLE TRAINING AIRCRAFT DELIVERY TO JSC

The first of two Shuttle Training Aircraft (STA) is scheduled to arrive at Ellington AFB on Tuesday, June 8.

The STA is a modified Grumman Gulfstream II twin engine jet aircraft that will be used in crew training to simulate the flight characteristics of the Shuttle Orbiter.

Johnson Space Center personnel will perform a receiving inspection on the aircraft after its arrival. The STA will then be returned late this month to Grumman, Bethpage, N.Y., for installation of an electric aileron trim system. This minor modification to the STA control system will take approximately one week.

The second STA will remain at Bethpage for continuation of the flight test program to insure that the various landing flight modes of the orbiter can be duplicated by the STA.

The remaining flight tests will concentrate on verifying the STA's ability to match the orbiter trajectory during the period from 35,000 feet through touchdown and verifying several recent engineering changes.

Trajectory matching is accomplished by utilizing thrust reverser engines and direct lift control to vary the Gulfstream II aerodynamics to provide flight characteristics similar to the Shuttle orbiter.

The second STA is scheduled for delivery to JSC late in July 1976.

- end -



NASA-JSC

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Robert V. Gordon

For Release:

June 9, 1976

RELEASE NO: 76-39

BUSS TEST FLIGHT SUCCESSFUL

A one ton scientific instruments package which drifted across the central Texas sky for 12 hours gathering information on various stars, including far distant giant and super-giant stars, was described by its U.S. and Dutch designers as the most successful balloon flight of its type ever conducted. It was the culmination of the 3-year international collaboration between the NASA Johnson Space Center, Houston, Texas, and the Space Research Laboratory at Utrecht, the Netherlands.

Dr. Yoji Kondo, astronomer at the Johnson Space Center, and co-principal investigator for the U.S., said the flight of the balloon-borne instruments was the best yet, in this seventh in a series of star studies which began in 1971. The 1,300 pound package of instruments was launched by a football-field-sized helium-filled balloon from the National Center for Atmospheric Research at Palestine, Texas. The Dutch team was lead by Dr. Cees de Jager, an internationally prominent space scientist.

The experiment, Balloon-borne Ultraviolet Stellar Spectrometer (BUSS), was raised to an altitude of 25 ^{40 km} miles by the balloon. This altitude is nearly 100 per cent above the Earth's atmosphere and gives the BUSS instruments a clear look at the stars. The balloon floated westward for nine hours at night. Data on 16 separate stars was gathered and radioed to the ground station where Dr. Kondo and his fellow scientists were monitoring the incoming information.

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The entire payload was successfully lowered to the ground by an 85-foot diameter parachute, similar to chutes used on the Apollo command module. The payload, chute and balloon landed at Ranger, Texas, midway between Abilene and Fort Worth and was recovered by NASA engineers who returned it to Houston.

The purpose of these balloon flights is to evaluate the experiment systems for possible use as experiments aboard the Space Shuttle, our nation's next manned spaceflight program scheduled to fly in early 1979.

Dr. Kondo explained the reasons for examining stars using this system. The BUSS package can gather information on spectral variations of a variety of stars and thereby aid scientists in determining their structure and evolution. Dr. Kondo, along with Drs. Roel Hoekstra, Karel vandeer Hucht, and Dutch project manager Theo Kamperman of the Space Research Laboratory, controlled the instruments while they were airborne by ground command.

Information on one star, super-giant 'Deneb', was of particular interest, according to Dr. Kondo. The huge star, in the Cygnus (or Swan) constellation is 1,400 light years away and the light recorded by the BUSS instruments was emitted at a time in history before Anglo-Saxons settled in England.

'Deneb' is so large, Dr. Kondo explained, that if you placed the Sun in its center, the Earth would orbit the Sun totally within the star's outer limits. 'Deneb' is several hundred times larger than the Sun. It is also losing a large amount of matter (more than several quadrillion tons a year), as it burns.

Among the other stars scanned during the nine hour data take were 'Arcturus', giant star in constellation Bootes, super-giant star alpha Scorpii (Antares), alpha Lyrae (Vega) and alpha Virginis (Spica), a very hot star and one of the brightest observed during the flight.

This is the largest amount of star data gathered during the BUSS program, Dr. Kondo said. Previous flights have also been able to obtain information on numerous stars but had only recorded one-fiftieth of the spectral

- 3 -

range covered with the current payload.

The team of U.S. and Dutch scientists, who have returned to the Netherlands, now begin an in-depth analysis of the information. It is anticipated that preparations for another balloon flight, now scheduled for sometime this fall, will be started soon.

Dr. Kondo has high praise for the engineers and technicians of the Lockheed Electronics Co. which furnishes JSC technical and operational support in this program. The NASA engineering manager was David White, Curtis Wells was the Lockheed team leader. The launch balloon was made by Winzen Research, Inc. Sulphur Springs, Texas, and was filled with 20-million cubic feet of helium.

Dr. Thomas H. Morgan and Dr. Jerry L. Modisette, Houston Baptist University are co-investigators with Dr. Kondo in this experiment.

The BUSS instruments are an Echelle spectrograph and an SEC vidicon telescope.

- end -

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Charles Redmond

For Release:
June 11, 1976

RELEASE NO: 76-40

JSC TO CONVERT TO SURFACE WATER

Officials of the Johnson Space Center will join representatives of the Clear Lake City Water Authority and the town of Nassau Bay on June 15, in ceremonies marking the conversion of the three neighboring areas from well-water to surface water.

Under an agreement with the Clear Lake City Water Authority, JSC will switch off its water pumps, which have been drawing about 700,000 gallons of water daily from the ground, and begin using surface water furnished by the City of Houston and the CLCWA.

For the past decade the land area on the west side of Galveston Bay including substantial sections of the Houston Ship Channel have been subsiding at a rate up to three inches a year. Robert Gabrysch, US Geological Survey in Houston, and other local authorities have directly linked the subsidence with the withdrawal of drinking and utility water from the ground.

The conversion of the space center and the surrounding residential neighborhoods represents a first step in an area-wide effort to curtail the subsidence. The space center's water use is a fraction of the Houston metropolitan area use, presently upward to 600 million gallons a day.

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Prior to 1954 nearly all water supplies for the Houston region were obtained from subsurface water. Approximately 350 million gallons a day were pumped from the ground in 1954. Ten years later this had increased to 411 million gallons. Current estimates reflect the 600 million gallon per day figure.

The USGS reported recently that subsidence in the Pasadena area measured 3.5 feet from 1964 through 1973. USGS figures for the Clear Lake City/NASA area show a subsidence of 2 feet from 1964 through 1973.

Since establishment of the space center in 1962, water for operations and maintenance has been furnished by three pumps. Daily JSC consumption has been between 600,000 and 800,000 gallons per day.

USGS and JSC geologists have shown that the degree of land subsidence is directly related to the volume of water pumped from beneath the surface. There is also evidence that each water well has a zone of influence toward subsidence which in turn contributes to localized subsiding.

Numerous surface faults in the area of the space center are currently active, as indicated by vertical displacement of roadways and structures at and near Ellington Air Force Base. A study recently concluded by NASA geologists indicates these fault lines have been activated or accelerated by the continuing decline of fluid pressures caused by withdrawal of both water and crude oil.

NASA management has worked for several years with the USGS to document the local subsidence and to correlate the subsidence with subsurface water withdrawal. JSC, however, could not consider conversion to surface water until a 42-inch water main was constructed under authority of the City of Houston.

Two years ago negotiations were begun with the Clear Lake City Water Authority for JSC purchase of surface water obtained through the Houston City main. A 10 year contract has been signed and contract terms call for the CLCWA to furnish surface water to JSC at established industrial water rates.

A Houston-Galveston subsidence panel is working to obtain similar agreements from other Galveston Bay Area subsurface water users.

The treated surface water will be relayed to the Clear Lake vicinity from the City of Houston 42-inch main which runs along the Old Galveston Road (Texas Highway 3). NASA, Nassau Bay, and the CLCWA shared the cost of installing a 24-inch line from Highway 3 to the CLCWA plant in Clear Lake, a distance of about 6,800 feet. NASA has absorbed the cost of the 18-inch water main from the CLCWA plant to the JSC water plant, a distance of another 6,400 feet.

In addition, JSC has constructed a 600,000 gallon storage tank adjacent to the center's existing one million gallon tank. Clear Lake City, Nassau Bay and the space center collectively use about 4 million gallons of water daily.

The three JSC wells will be maintained and placed on stand-by status for emergency use only in the event of a water-main interruption.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center

Houston, Texas 77058
AC 713 483-5111

Robert V. Gordon

For Release:

June 11, 1976

RELEASE NO: 76-41

NASA NEGOTIATES SHUTTLE ORBITER SUPPLEMENTAL AGREEMENT

NASA has negotiated Supplemental Agreement No. 89 to the Basic Shuttle Orbiter Contract (NAS9-14000) with Rockwell International, Space Division. The value of the procurement action is \$3,676,500.

The five products involved are long lead time/economic buy actions to furnish hardware and materials for the production orbiter.

The items are glass window panes from Corning Glass Works at Corning, N.Y.; American Enka Rayon Yarn for LTV and green silicon carbide from Carborundum Corporation for LTV, both of these items are for the leading edge structural subsystem, with work performed at Dallas, Texas; remote power controllers from Westinghouse, with work performed at Lima, Ohio and event indicators from Weston Instruments with work at Newark, N.J.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

RELEASE NO : 76-42

For Release:

June 18, 1976

JSC Vacuum Chamber to Restore Flood-Damaged Records

The Johnson Space Center will use one of its space environment simulation chambers to dry irreplaceable records and documents damaged in Houston's flood, June 15.

The first batch of records will be dried at noon tomorrow in the vacuum chamber. It consists of medical records from Methodist Hospital and valuable, irreplaceable books from the Contemporary Arts Museum as well as Museum records.

James C. McLane, Jr., Space Environment Test Division Chief, said the material would be placed on heated shelves inside the chamber. The shelves will be heated to 120 degrees Fahrenheit and the chamber pumped to a vacuum. The process will take anywhere from 48 to 72 hours, according to McLane. The first batch of records may be dried by as early as Tuesday.

This technique was pioneered by the McDonnell Douglas Aircraft Corporation for a similar project for the U.S. Air Force when records in St. Louis were water-damaged in a fire.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:
June 30, 1976

VACUUM CHAMBER DRYING TECHNIQUE SUCCESSFUL FOR FLOOD-DAMAGED RECORDS

Administrative records from the Methodist Hospital and some rare art books from the Contemporary Arts Museum have been successfully restored in one of the Johnson Space Center's large vacuum testing chambers.

The records and books were damaged when flood waters inundated the basements of the Methodist Hospital and the CAM during the heavy downpour in Houston on June 15 and 16. The space center volunteered the use of the vacuum chamber to dry records which would have otherwise mildewed.

JSC is presently drying material from St. Joseph's Hospital and the University of Houston Law Library. The technique of using a vacuum chamber to dry water-damaged material was first used by the McDonnell Aircraft Corporation and later by the General Electric Company. The Johnson Space Center now joins a rather unique list of high-technology institutions which have used space environment simulation chambers for the restoration of valuable documents.

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NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Jack Riley

For Release:

RELEASE NO: 76-44

A.M. July 8, 1976

ALSO RELEASED AT NASA HEADQUARTERS

NASA TO RECRUIT SPACE SHUTTLE ASTRONAUTS

NASA issued a call today for Space Shuttle astronaut candidates. Applications will be accepted until June 30, 1977, and all applicants will be informed of selection by December 1977.

At least 15 pilot candidates and 15 mission specialist candidates will be selected to report to the Lyndon B. Johnson Space Center, Houston, Texas, on July 1, 1978, for two years of training and evaluation. Final selection as an astronaut will depend on satisfactory completion of the evaluation period.

NASA is committed to an affirmative action program with a goal of having qualified minorities and women among the newly selected astronaut candidates. Therefore, minority and women candidates are encouraged to apply.

- more -



Pilot applicants must have a bachelor's degree from an accredited institution in engineering, physical science or mathematics or have completed all requirements for a degree by Dec. 31, 1977. An advanced degree or equivalent experience is desired. They must have at least 1,000 hours first pilot time, with 2,000 or more desirable. High performance jet aircraft and flight test experience is highly desirable. They must pass a NASA Class 1 space flight physical. Height between 64 and 76 inches is desired.

Applicants for mission specialist candidate positions are not required to be pilots. Educational qualifications are the same as for pilot applicants except that biological science degrees are included. Mission specialist applicants must be able to pass a NASA Class 2 space flight physical. Height between 60 and 76 inches is desired.

Pay for civilian candidates will be based on the Federal Government's General Schedule pay scale from grades GS-7 through GS-15, with approximate salaries from \$11,000 to \$34,000 per year. Candidates will be compensated based on individual academic achievements and experience. Other benefits include vacation and sick leave and participation in the Federal Government retirement, group health and life insurance plans.

Civilian applicants may obtain a packet of application material from JSC. Requests should be mailed to either Astronaut (Mission Specialist) Candidate Program or Astronaut (Pilot) Candidate Program, Code AHX, NASA Johnson Space Center, Houston, Texas 77058.

Military personnel should apply through their respective military departments using procedures which will be disseminated later this year by DOD. Military candidates will be assigned to JSC but will remain in active military status for pay, benefits, leave and other military matters.

Currently, 31 persons are available as Space Shuttle crewmen, including nine scientists. Twenty-eight of them are astronauts assigned to the Johnson Space Center and three hold government positions in Washington, D.C.

The Space Shuttle is a reusable vehicle that will replace virtually all of this nation's space launch vehicles. Shuttle missions could include deploying and retrieving satellites, servicing satellites in orbit, operating laboratories for astronomy, Earth sciences, space processing and manufacturing, and developing and servicing a permanent space station.

Launched like a rocket, the Shuttle will perform Earth orbital missions of up to 30 days, then land like an airplane and be refurbished for another mission. Pilot astronauts will control the Shuttle during launch, orbital maneuvers and landings and be responsible for maintaining vehicle systems. Mission specialist astronauts will be responsible for the coordination of overall orbiter operations in the areas of flight planning, consumables usage and other activities affecting payload operations. At the discretion of the payload sponsor, the mission specialist may assist in the management of payload operations, and may, in specific cases, serve as the payload specialist. They will be able to continue in their chosen fields of research and to propose, develop and conduct experiments.

Crews could consist of as many as seven people -- commander, pilot, mission specialist and up to four payload specialists, who need not be NASA employees and who will be nominated by the sponsors of the payload being flown. Payload specialists will operate specific payload equipment where their special skills are needed.

Potential users of the Space Shuttle include government agencies and private industries from the United States and abroad.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release:

RELEASE NO: 76-45

Immediate

HOLT CUSTODIAL SERVICES CONTRACT

Klate Holt Company of Houston, has been awarded a one-year \$1.5 million contract extension for custodial support services at the NASA Johnson Space Center.

The cost-plus-award-fee contract was originally awarded to Holt in July 1975. This extension is through June 30, 1977. The contractor employs approximately 160 persons who furnish custodial services in the 82 buildings at the space center and 16 buildings which JSC elements occupy at nearby Ellington Air Force Base.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release:

Release No: 76-48

July 27, 1976

ALSO RELEASED AT NASA HEADQUARTERS

SIMULATION COMPLEX SUPPORT CONTRACT AWARDED

The National Aeronautics and Space Administration has selected The Singer Co. Simulations Products Division of Binghamton, N.Y., for award of a contract for maintenance, modification, and operational support of the Lyndon B. Johnson Space Center Simulation Complex at Houston, TX.

The Simulation Complex will initially consist of the Shuttle Procedures Simulator (SPS) and the Crew Procedures Evaluation Simulator (CPES). The Orbiter Aeroflight Simulator (OAS) will be added early in the contract followed by the Shuttle Mission Simulator (SMS). These simulators will be used for flight crew training for the Space Shuttle program.

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The estimated cost for the initial 2-year cost plus award fee contract is approximately \$6.5 million. Two additional, optional performance periods of 24 and 6 months, respectively, are also contemplated.

The work to be performed includes systems and hardware engineering, software development, drafting and illustration, configuration control, and installation and testing of modifications to update simulation equipment to configurations compatible with NASA requirements. Also required is the maintenance, servicing, and operational support of the equipment, plus other miscellaneous tasks such as documentation and logistics support.

Negotiations also were held with the McDonnell Douglas Corp., Technical Services, Co., Inc., St. Louis, MO.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 76-49

August 4, 1976

SUPPLEMENTAL AGREEMENT SIGNED WITH LOCKHEED

The Johnson Space Center, Houston, has signed a supplemental agreement with Lockheed Electronics Company, Inc., Houston, for additional support at the Slidell Computer Complex, Earth Resources Laboratory, in Slidell, Louisiana.

The additional contract agreement is for \$2.57 million and brings the total value of the contract to \$7.1 million.

The contract provides for scientific and technical support at the Earth Resources Laboratory.

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NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert V. Gordon

For Release:

RELEASE NO: 76-51

August 12, 1976

Also Released at NASA Headquarters

NOTE TO EDITORS:

SPACE SHUTTLE ROLL-OUT SET FOR SEPTEMBER 17

Roll-out of the first Space Shuttle Orbiter will occur on Sept. 17, 1976,
at the NASA/Rockwell International Space Division facility, Palmdale, Calif.

A ceremony to mark this milestone in the nation's future Space
Transportation System will take place at 9:30 a.m. PDT. Media representatives
are invited to attend.

Press facilities will be available on site for radio, television and
print coverage. Formal application for accreditation is not necessary, however,
newsmen planning to attend are asked to notify Bob Gordon by letter (Code AP3,
Johnson Space Center, Houston, Tex. 77058) or telephone 713/483-5111. Access
badges will be issued at the News Center Building 743, upon presentation of
credentials.

The News Center will open Sept. 16, one day prior to the roll-out.



NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

RELEASE NO: 76-52

For Release:
August 31, 1976
2 pm CDT

JSC NEGOTIATES WITH MASON-REGUARD
FOR PROTECTIVE SERVICES CONTRACT ✓

The NASA Lyndon B. Johnson Space Center, Houston, has selected Mason-Reguard of Lexington, Kentucky for negotiations leading to award of a cost-plus-award-fee contract for protective support services at the Center.

Included in protective services are security, police services, operation of fire department, safety/fire engineering, and emergency ambulance service. Mason Reguard's proposed cost and fee for providing these services for the period October 1 1976 through September 30, 1977 is approximately \$1,837,000.

NASA has the option to extend the contract at the end of the first year for two more one year periods.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 76-57

X

September 10, 1976
2 p.m. CDT

JSC AWARDS SHOP SUPPORT CONTRACT TO DI-JAY, INC.

The NASA Lyndon B. Johnson Space Center, Houston, Texas, has selected Di-Jay, Inc. of Seabrook, Texas, for negotiation of a contract for central shop support services at the Center.

Di-Jay will be responsible for management, supervision, services and materials to perform support services in aerospace electronic instrument fabrication, precision cleaning, and metal finishing support of the JSC Technical Services Division central shop.

The cost-plus-fixed-fee contract begins October 1, and runs through September 30, 1977, and has an estimated value of \$451,000. Di-Jay will employ about 24 people for the contract.

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NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton Reim

For Release:

RELEASE NO: 76-58

September 15, 1976

SECOND OF TWO SHUTTLE TRAINING AIRCRAFT DELIVERED TO JSC

The second of two Shuttle Training Aircraft (STA) was delivered to the NASA Johnson Space Center today. The first STA was delivered to JSC on June 8, 1976. The aircraft will be used in training pilots for the United States newest space transportation system, the Space Shuttle.

The modified Grumman Gulfstream II twin engine jet aircraft was flown to Ellington Air Force Base from the Grumman plant in New York.

The STA aircraft will simulate Shuttle Orbiter handling qualities, performance characteristics, and flight control procedures during the subsonic atmospheric flight phase from 35,000 feet altitude to simulated Orbiter touchdown.

This flight profile is accomplished through the independent control of six-degrees of freedom, effected with the use of normal Gulfstream II



control surfaces as well as auxiliary direct lift, side force control surfaces, and in-flight reverse thrust. The motions of these surfaces are commanded by an airborne digital computer with a model-following technique.

To do this, the full six-degree of freedom Orbiter equations of motion are mechanized within the airborne digital computer. The STA responses to the simulation pilot commands are compared with those of the Orbiter, and the STA control surfaces are driven to eliminate response differences. The STA is consequently forced to follow the Orbiter model.

The simulation pilot occupies the left side of the STA cockpit, which incorporates Orbiter flight instruments and controls. An instructor pilot occupies the right-hand seat, which is equipped with standard Gulfstream II controls and instruments. The simulation pilot will normally have control of the STA during training exercises, but the instructor pilot can assume STA control at any time by depressing a single disengage switch.

The third member of the crew for the STA training flights is the flight simulation engineer. He sits in a jump seat behind the two pilots

where he operates the simulation computer and assists the instructor pilot.

Training of the crews for the Approach and Landing Test flights of the Shuttle Orbiter is scheduled to begin late in October.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 76-59

September 21, 1976
2 p.m. CDT

NASA JSC MODIFIES CONTRACT WITH IBM

The NASA Lyndon B. Johnson Space Center, Houston, Texas, has modified a contract with International Business Machines Corporation, Gaithersburg, Maryland, to cover software for ground-based computing and data processing systems at the Center.

Modification of the cost-plus-award-fee contract with IBM brings the contract value to \$19,463,000. IBM will develop computer programs for vehicle mission management and flight operations for the Space Shuttle Program and related scientific and medical operations.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton Reim

For Release:

RELEASE NO: 76-60

September 22, 1976
2 p. m. CDT

MCC SUPPORT CONTRACT SIGNED WITH AERONUTRONIC FORD

The National Aeronautics and Space Administration has signed a contract with Aeronutronic Ford Corporation for support services for Mission Control Center (MCC) and various other ground based data systems managed by the Johnson Space Center (JSC) at Houston, Texas.

Work to be performed consists of ground data hardware and software systems engineering, implementation, maintenance and operations. Other functions under the contract will include logistics, reliability and quality assurance for MCC and other JSC managed ground based data systems.

Aeronutronic Ford will perform the majority of the work at the Houston, Texas, location with support from its facilities at Willow Grove, Pennsylvania.

Contract NAS9-15014 is a cost-plus-award-fee contract. The contract effort is valued at about \$46,550,000 with the period of performance from July 1, 1976 through September 30, 1978.

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NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 76-61

September 24, 1976
2 p.m. CDT

NASA NEGOTIATES WITH HAMILTON STANDARD FOR SHUTTLE OXYGEN SYSTEM CONTRACT

The NASA Johnson Space Center, Houston, Texas, has selected Hamilton Standard Division of United Technologies Corporation, Windsor Locks, Connecticut, for negotiations that will lead to award of a contract for development and production of a portable oxygen system for Space Shuttle crew and passengers.

The system consists of a face mask, rebreather loop, heat exchanger, oxygen bottle and recharge kit and will be capable of independent operation or connected to the Shuttle oxygen system. The portable oxygen system will meet four special Shuttle needs: emergency oxygen in case of cabin atmosphere contamination, prebreathing before spacewalks for denitrogenizing crewmen's circulatory systems, life support during rescue operations, and emergency oxygen after landing if the atmosphere around Shuttle Orbiter is contaminated.

- more -



Amount of the proposed cost-plus-fixed-fee contract to Hamilton Standard will be approximately \$1.9 million, and will run from November 13, 1976, to July 13, 1979.

Under provisions of the proposed contract, Hamilton Standard will deliver ten oxygen supply units and 50 recharge kits for NASA certification, training and flight use as well as provide ground support equipment and manpower. The contract will also contain options for 62 additional units and 310 recharge kits.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert T. White

For Release:

RELEASE NO: 76-63

October 13, 1976
1:00 pm CDT

NASA-JSC PICKS ALPHA FOR CONSTRUCTION CONTRACT NEGOTIATIONS

Alpha Building Corporation of Houston has been selected for negotiations leading to the award of a cost-plus-award-fee contract for Construction Support Services at the Lyndon B. Johnson Space Center, Houston, Texas.

The services include minor construction and alteration of laboratory systems, facilities, utilities, roads, sewers, walks, and other site work as required by space program requirements and shall normally be for projects estimated at \$10,000 or less.

Proposed cost and fee for providing these services for the period beginning December 1, 1976, and ending November 30, 1977, is approximately \$1,369,000.

At the end of the first contract year, the Government has the option to extend the contract for two additional 1-year periods.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

October 19, 1976

RELEASE NO: 76-64

SCOUTS HOLD SPACE-ARAMA CAMPOUT AT JSC

More than 300 Bay-area Boy Scouts are expected to pitch their tents at the NASA Johnson Space Center Friday, October 22, 1976, to begin a three-day Bayshore District Space-Arama. The campsite will be in a wooded area near the northeast edge of the Center.

In addition to Scout competitions, demonstrations and displays, the Scouts will visit a full-scale mockup of the Space Shuttle in the Mockup Trainer Development Laboratory as well as making a tour of other areas of the Center.

Home-built spacecraft, built by Scout patrols and troops, will compete in Sunday morning's Great Space Race just prior to the closing ceremony and striking camp. Winners of the Great Space Race will be the guests of Astroworld in November.

For further information, call Mike Hazelrigs at (office) 713-333-6401, or (home) 713-333-3529.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:
October 19, 1976

RELEASE NO: 76-65

NASA GATHERS DATA FOR SETTING FEMALE ASTRONAUT CRITERIA

Physicians at the NASA Johnson Space Center in Houston are gathering baseline data on female physiological performance and tolerance limits as an aid in setting criteria for recruiting the agency's first women astronauts.

JSC cardiologist Dr. R. L. Johnson of the Cardiopulmonary Laboratory is seeking answers to whether women respond differently from men of comparable age to treadmill exercise and to circulatory system stresses induced by decreased lower body pressure. Women employees at the Center are being asked to volunteer for testing on a treadmill and in a Lower Body Negative Pressure (LBNP) device to provide some baseline data on women.

"We expect to use both of these tests in the selection of pilots and mission specialists in the Shuttle Program," Johnson said. "Although the tests have been conducted with many male subjects in the past, there is little information on how women respond to treadmill exercise," he said.

By testing representative groups of female volunteers, the Cardio-



pulmonary Laboratory hopes to furnish information to serve as background for some of the selection criteria to be used for women astronaut applicants.

On the treadmill test, speed and tilt of the moving belt is varied while the subject's heart rate and blood pressure are monitored. The LBNP device encases the subject from the waist down. Pressure in the chamber is then reduced and the reaction of the cardiovascular system to pressure changes is observed.

"During the course of these tests, we will obtain electrocardiograms and vectorcardiograms, and perform some non-invasive test that evaluate hearts sounds and mechanical efficiency of the heart," Johnson said. "These provide a good index of cardiac status."

NASA is accepting applications for at least 30 Space Shuttle astronauts - 15 pilot candidates and 15 mission specialist candidates - with a closing date of June 30, 1977. The call for Shuttle astronaut applicants was issued in July 1976. After the June 1977 deadline, selection will be completed by December 1977.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111



Robert V. Gordon

For Release:
October 22, 1976

RELEASE NO: 76-66

JSC FACILITY TO DEVELOP SPACE CARGO HANDLING METHODS

A new laboratory at the NASA Johnson Space Center is currently determining how to apply the use of industrial robot and teleoperator technology to the movement of delicate instruments and cargo in and out of the Shuttle Orbiter, the space transportation system workhorse of the 1980's and 90's.

15.2 m
The recently completed Manipulator Development Facility at JSC incorporates what may be the world's largest remotely controlled manipulator system. A super size of the mechanisms used in industry, the manipulator system has a reach of nearly 50 feet and will be used with other equipment to study problems associated with payload deployment and retrieval in space.

4.3 m
The Space Shuttle, which will become operational in the early 1980's, will carry various payloads, ranging in size from very small to a maximum of 15 feet in diameter and 60 feet long. The Orbiter will launch from Earth like a rocket and land like an aircraft.

16.2 m -more-



The versatile remote manipulator arm, located in the Orbiter's 60 foot long cargo bay, will be operated by an astronaut who directs the arm with a pair of hand controllers from inside the Orbiter cabin. The astronaut views the operation through a window, and is also aided by a closed circuit television system.

How to move payloads in the weightless environment of space, and how to operate efficiently and safely in space are among the key questions which will be answered by NASA engineers and technicians through the MDF.

In addition to the manipulator arm, the laboratory (Building 9A at JSC) houses high fidelity working models of Orbiter components, including a full scale orbiter forward cabin section, a 15 by 60-foot cargo bay, manipulator operating station, and an 80 by 100-foot air bearing table. Large simulated payloads can be steered by the remote arm as the payloads float over a cushion of air. The overall system is linked by computer and closed circuit television.

Handwritten notes: 24.3m X, 30 1/2m

Although the immediate objective of the facility is to devise techniques on how to move bulky payloads, such as satellites, in and out of the Orbiter's payload bay, this unique lab may one day become one of the numerous training tools to be used by Shuttle astronauts.

-more-

The MDF also will be the proving ground on man's ability to walk like a fly inside the Shuttle Orbiter. It has been a problem for American astronauts, particularly in the Skylab program (1973-74), to be able to hold themselves in one spot without awkward cleats which locked to the grid floor.

Since Shuttle will be a day-to-day work place in space in the 1980's and 90's, it is necessary that astronauts be able to anchor themselves to the flat, smooth interior of the Orbiter and move with ease. Suction cup shoes have been selected as the design solution.

Engineers at NASA have taken a suction cup, commonly used by glass workers, and modified it for use aboard Shuttle. To test this concept, an engineer wearing the suction cup shoes, is strapped (horizontally) in a cage-like apparatus which is placed aboard the air bearing table. Jets of air are forced out the bottom, and the engineer literally floats across the floor.

This method virtually removes any friction of movement and the engineer "walks" along the side of the wall.

The overall operation of the Manipulator Development Facility is under the direction of the Spacecraft Design Division which is headed by Allen J. Louviere.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

RELEASE NO: 76-67

For Release:

October 21, 1976

TESTS SEEK CAUSE FOR MOTION SICKNESS

Studies following American and Soviet manned space flights, and studies conducted by Johnson Space Center scientists aboard a zero-gravity training aircraft indicate that zero gravity and hyper gravity affect the nervous system.

Aircraft parabolic flights with subjects strapped on a couch parallel to the flight path have shown that a specific reflex relayed through the spinal column, the Hoffman reflex, is potentiated (heightened) during periods of zero gravity for the duration of the weightlessness. This same reflex is attenuated (reduced) during periods of hyper gravity.

The Hoffman reflex is considered by neurophysiologists as a good reflex for testing the effects of gravity on reflex activity since it is easily monitored, and involves the spinal column for the feedback portion of the nerve loop. In these tests an electrical current is applied to a nerve behind the knee and the response is measured from the calf muscles. The potentiation or attenuation is measured as electrical output from the muscle.

-more-



In addition to this objective testing, subjects are asked a battery of subjective questions following each parabolic flight to determine their instances of motion sickness symptoms.

Results of the aircraft testing are, in part, being evaluated in terms of the reflex variability to determine if different reflex patterns can be related to individual susceptibility to motion sickness.

It is anticipated that these aircraft tests may help predict susceptibility to motion sickness.

However, the study of motion sickness and the attendant studies of postural control are especially difficult because of the large number of separate sensory inputs to the brain. Alterations in vestibular inputs from the semicircular canals and otoliths in the inner ear, visual inputs from the eyes, and position inputs from muscles used for postural control all can contribute to ataxia, or disequilibrium and motion sickness.

The NASA zero-g aircraft tests supplement information gathered on vestibular functions during the three manned Skylab missions in 1973-4 and on previous Apollo flights.

Experiments aboard Skylab revealed a considerable amount of vestibular relearning within the first two weeks of spaceflight. Some crewmembers experienced symptoms equivalent to motion sickness for the first few days of space flight, presumably as a result of adaptive processes in the central nervous system. However, all crewmen became very resistant to motion sickness after about 14 days of spaceflight. Also some crewmen reported slight disorientation when placed in a situation where they

-more-

were not upright in a locally defined "up" area of the spacecraft. This was particularly evident during Skylab with the space station's vast areas of living space. There appears to be no correlation between an astronaut's susceptibility to motion sickness on the ground and his susceptibility in space. It is this question concerning susceptibility which the aircraft tests aim to answer.

The theories postulated to explain human balance and posture presently are not well defined. However, there are generally accepted components and these are visual input from the eyes, which define the local vertical environment; the vestibular input from the semicircular canals and otoliths in the inner ear, which sense angular and linear acceleration and the presence or absence of gravity; and muscle sensors which monitor posture. These inputs are interrelated and normally function to maintain the body in a balanced posture. It is believed that ataxia is a response of the brain to unusual information from one or more of the various sensors. Balance itself is reflexive in an earth-normal gravity, that is, we are not conscious of the patterns of body movements which help us to remain upright and walk.

On a moving vehicle many of these inputs to the brain will provide contradictory information and a feeling of discomfort often results. However, motion sickness itself is not an adaptive response and does not improve the situation as, for example, coughing helps eliminate a blockage of the throat. Motion sickness has been experienced by persons without sight but not by persons without vestibular functions intact. It seems then that motion sickness is more directly related to vestibular input, though all of the senses mentioned can contribute to the problem.

-more-

Although not much is yet known about the exact interactions among these three sensory systems, it is strongly postulated that the otolith is the receptor affording the most direct gravity information and therefore the source of many of the inputs leading to motion sickness, ataxia or disequilibrium.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Bob Gordon

For Release:

November 4, 1976

RELEASE NO: 76-69

BOEING SELECTED FOR SOLAR POWER STUDY

The Boeing Aerospace Company today was selected by the National Aeronautics and Space Administration for negotiations that will lead to the award of a contract to study spacebased solar power concepts. Value of the contract is approximately \$970,000, which is jointly funded by the Energy Research and Development Administration and NASA.

The terms of the 12-month, two-phase study, call for Boeing to first derive specific, comprehensive data necessary for NASA on the most effective means of accomplishing solar energy-to-electrical energy conversion on a solar power satellite system and also determine at what location (or locations) in space the various phases of the solar power satellite should be constructed and assembled.

- more -



The second part of the study calls for Boeing to define in more detail the overall solar power satellite system to reduce the uncertainties in the areas of weight and cost estimates. The first phase of the contract is five months in duration and the second phase is seven months long.

The study, along with other related studies conducted by NASA and by outside contractors, will by mid-1978, develop the information necessary to make further assessment of the technical and economic feasibility of the space solar power concept.

The solar power satellite system is envisioned as a means of providing uninterrupted energy beamed to Earth from large satellites in a fixed orbit 22,000 miles above the Earth.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Brenda Sturman

Charles Redmond

525-5111

RELEASE NO: 76-70

Q. date?

*Called SSC twice,
20 Mar 81 = no reply
both times, asked them to return call*

*Called SSC 23 Mar 81 =
Mr White got on phone
to give me "title" of*

*release (Date was
10 Nov 76.)*

For Release:

Upon Receipt

NASA SCIENTISTS RELY ON BALLOONS

The Earth's atmosphere is both an object of investigation and a hindrance to investigation. The object of some studies is the ozone layer, a layer of oxygen which shields the Earth from harmful ultra-violet radiation. That ozone layer, however, absorbs almost all of the ultraviolet radiation and cosmic rays which other scientists would like to study.

At the Johnson Space Center in Houston, scientists studying the upper atmosphere -- location of the ozone layer, exotic cosmic rays and particles such as anti-matter -- which are absorbed by the atmosphere, and astronomers testing a new type of ultraviolet telescope, all rely on helium-filled balloons of tremendous size to get their instruments high above the Earth.

- more -



Balloons are used because of certain advantages they hold over other vehicles like airplanes and sounding rockets which also operate in the rarified atmosphere between 30 and 50 kilometers (18 and 31 miles).

Whereas an airplane can carry experiments to high altitudes, it cannot remain stationary for long periods as balloons can. And, the higher the airplane flies, the less payload it can carry. A balloon can carry an extremely heavy payload like 1,800 kilograms (4,000 lbs.) as high as 50 kilometers. Sounding rockets can, of course, fly much higher, but the time they spend in the stratosphere is measured in minutes -- balloon time can be extended to days and weeks.

For these certain advantages NASA uses balloons extensively for a wide range of tests and experiments conducted not only by JSC but other NASA centers as well.

In upper atmospheric studies the Environmental Effects Office at JSC has been using balloons for three years as part of the Space Shuttle stratospheric environmental evaluation and the national examination of the effects on the ozone layer of fluorocarbons (such as Freon) and other gaseous products. The ozone layer is a protective blanket of oxygen which appears to be chemically fragile.

Results of these studies have contributed substantially to the knowledge of the chemical interactions in the upper atmosphere. These results include the first profiles of the concentrations of the gasses chlorine and chlorine oxide and atomic oxygen and hydroxyl radicals at stratospheric altitudes. The National Research Council recently recommended reducing the amount of fluorocarbons released into the air. The

Council recommendations were based in part on information gathered on JSC balloon flights.

The cosmic ray experiments are studying fundamental properties of high energy particles by observing the effects of such phenomena as cosmic rays. The JSC Space Physics Branch has developed a cosmic ray laboratory which is providing new information about high energy particles. The cosmic ray lab and earlier, less sophisticated, payloads have been flown many times to observe particles such as anti-protons and positrons (anti-electrons). These anti-matter particles are thought to exist naturally but their exact quantity is not known. The cosmic ray experiments will help substantiate or alter present theories about cosmic evolution. There are only a handful of laboratories in the world pursuing these studies.

The astronomy observations are part of tests of an ultraviolet telescope being developed by the JSC Space Physics Branch and the Space Sciences Laboratory at Utrecht, the Netherlands. This joint effort has sought to develop a telescope which would look at deep-space objects in the mid-ultraviolet, a range of light which is opaque to ground observation from Earth, but now accessible to observations from extremely high altitudes -- preferably space. The UV telescope is considered a good candidate for early use aboard the Space Shuttle and for possible use aboard the Spacelab flights in the mid-1980's.

The UV telescope is being tested aboard a balloon to allow the telescope to float above 95 percent of the Earth's atmosphere thereby providing astronomers with data almost as high in quality as if it were flown in space.

All of the balloons are launched from Palestine, Texas, by the National Center for Atmospheric Research (NCAR). NCAR (pronounced encar) was established by the National Science Foundation to operate and manage a launch facility for organizations in need of these huge balloons-- sometimes as large as hundreds of feet in circumference.

JSC buys the balloon from an independent manufacturer which makes the plastic envelopes according to the altitude and weight capabilities needed. The payload is also prepared by JSC. Other users of the NCAR facility buy their own balloons and prepare their payloads in much the same manner. Once the balloon and payload are ready, personnel from NCAR do the actual helium filling and launching.

The payloads attached to the balloons are connected to a parachute so that when the experiment or test is completed, sometimes days after launch, the payload can be safely returned to the ground. The balloons are not recovered.

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Editor's Note:

A pictorial essay of the launch and recovery of a typical balloon and payload are available by contacting the Public Information Office, AP3, Johnson Space Center, Houston, Texas 77058.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

RELEASE NO: 76-72

For Release:

Upon Receipt

Nov. 24, 1976

ALTERNATE MARTIAN CHANNEL THEORY PROPOSED

Low viscosity lava, not water, may have caused the large channels on Mars, a scientist at the Johnson Space Center says.

In a paper to be presented at the Meeting of the American Geophysical Union in San Francisco in December, Ernest Schonfeld says the Martian channels could have been formed by a thin, runny, turbulent lava rather than torrents of water proposed by other scientists.

Schonfeld, a lunar scientist working at JSC's Division of Lunar and Planetary Sciences, says the creation of large channels is probably easier to explain with lava than with water. The abundant large channels are one of the most puzzling landforms on Mars. Previous interpretations of Mariner and Viking mission photographs have suggested the channels are remnants of old rivers or floods of water.

- more -



Scientists have not been able to identify the thick sediment deposits that should have resulted if the channels were eroded by water. Viking I landed near the mouth of a very large channel where thick sediment deposits would have been expected. However, the rocks at the Viking I site appear to be volcanic.

Schonfeld proposes that thin, low viscosity basaltic liquid melted beneath the planet's surface and flowed freely to erode the surface channels. The apparent coincidence of the age of the volcanic activity and the Martian channel erosion supports that idea.

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November 24, 1976

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release.

RELEASE NO: 76-74

December 3, 1976

ALT 747 MAIDEN FLIGHT

A 747 jetliner, modified for use in the Shuttle Orbiter Approach and Landing Tests, ^{12/2/76} Thursday was test flown at Seattle, Washington, and program officials at the NASA Johnson Space Center described the one hour, 40-minute flight as very successful.

Carl A. Peterson, JSC manager for the 747 project, said he was very pleased with the results of the initial flight which was conducted at the Boeing Aerospace Company facility near Seattle. The 747 was flown by a combined NASA and Boeing flight crew and carried 15 engineers who checked out data acquisition and systems performance.

The 747 will undergo ten more test flights in Seattle before its delivery early next year to the NASA Dryden Flight Center, Edwards, California, where the Shuttle Orbiter flight test program will be conducted.

- more -



The 747 will carry the Orbiter to about 22,000 feet and release the 150,000-pound unpowered spaceplane which will be piloted to a landing at Edwards Air Force Base.

Modifications to the 747, which NASA purchased in June 1974, began earlier this year and include increasing the power of the four engines, adding stabilizer fins to the horizontal tail, installing struts to hold the Orbiter and adding instrumentation and equipment to monitor and analyze flight performance during the Approach and Landing Test program. In addition to the 22 ALT flights the 747 will be used in 265 ferry flights, carrying the Orbiter to and from launch and landing sites.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center

Houston, Texas 77058

AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 76-75

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

U.S. TO STUDY NEW SOVIET MOON SAMPLE

Several grams of moon soil collected last August by an unmanned Soviet spacecraft have been transferred to NASA for analysis by American scientists, the space agency has announced.

A three-member U.S. scientific delegation returned Thursday (Dec. 16) from Moscow, where they examined the two-meter (six-foot)-long core of moon soil collected and brought to Earth by the Luna 24 spacecraft this past August.

The Luna 24 material, from a region of the moon called Mare Crisium (Sea of Crises), will be the third Russian sample obtained by American scientists in exchange for material collected by Apollo astronauts from other places on the moon.

- more -



Although the Luna 24 material is not the first Russian sample to be obtained, its arrival at NASA's Lunar Sample Curatorial Facility in Houston, Tex., will generate excitement among the several hundred scientists who are involved in an active program of lunar sample research.

"The Luna 24 sample is unique in two ways," says Dr. Noel Hinners, NASA Associate Administrator for Space Science. "First, it comes from a region of the Moon from which we have never obtained samples. Even more important is the fact that Luna 24 obtained a complete core down to a depth of two meters (about six feet) so we have a new slice to add to the three deep cores collected by the Apollo Program."

The historical record contained in the Luna 24 core may go back several hundred million years. From studies on the larger, deeper (3 meters or about 10 feet) cores of lunar soil returned by the Apollo 15, 16 and 17 missions, scientists expect that the Luna 24 core will also contain many different soil layers, each one representing the excavation of a small impact crater somewhere on the Moon. Measurements on the Apollo cores have shown that some of these layers were deposited as much as a billion years ago, and each layer preserves traces of exposure to the Sun and cosmic rays during the Moon's past. The Luna 24 core will make it possible to extend this lunar history into a once-unknown part of the Moon.

- more -

Study of the Luna 24 sample will test the belief that Mare Crisium is covered by dark-colored lava flows that poured out onto the Moon more than three billion years ago. The sample will also provide essential geological and chemical information to add to the data accumulated from samples collected by the six manned Apollo and two unmanned Luna landings.

An important aspect is the possibility the sample contains particles of the blanket of material thrown out of the huge crater Giordano Bruno, about 1,200 kilometers (745 miles) away, according to Dr. Michael Duke, curator of lunar samples at NASA's Johnson Space Center, Houston. This would be significant since Giordano Bruno crater is on the Moon's far side, an area extensively mapped from orbit but never actually sampled. This sample could contain the first material ever returned that is directly related to a feature on the Moon's far side.

The Luna 24 core may also preserve a potentially exciting record of the past history of the Sun. The soil, formed by meteorite bombardment, has been exposed for millions of years to all the solar and cosmic radiation that strikes the surface of the airless Moon. Trapped in the soil fragments are actual atomic particles blasted out of the Sun millions of years ago. By comparing the Luna 24 core with similar cores returned by the Apollo missions, scientists hope to obtain new information about how the Sun has behaved in the past.

- more -

The Luna 24 samples also will provide a test of predictions made by observing the unexplored regions of the Moon through Earth-based telescopes. Scientists who have made spectral studies of the light reflected by lunar samples predict that the Luna 24 material will be a basalt lava with a low titanium content, much like the lavas returned by the Apollo 12 and Luna 16 missions. If these predictions turn out to be correct, scientists can obtain better chemical analyses of the Moon from telescopic observations or from instruments in orbit around the Moon.

The small amount of sample available presents no problems for getting out the necessary scientific information. "The Apollo Program helped develop many methods for getting a lot of information out of very small samples," said Dr. Bevan French, Chief of NASA's Extraterrestrial Materials Research Program. "With the methods now available, we can produce hundreds of chemical analyses from a single tiny crystal or determine the age of rock fragment smaller than an aspirin tablet." Many of these techniques are now being routinely applied to obtain exciting new information from meteorites and terrestrial deep-sea basalt samples, Dr. French said.

The Luna 24 spacecraft was launched from the Soviet Union on Aug. 9 and landed on Mare Crisium on Aug. 18. (Mare Crisium is visible to the unaided eye as a small dark spot on the upper right-hand edge of the Moon.) The robot spacecraft sent a thin, flexible, hollow drill about six feet into the ground, obtaining a complete section of

- more -

the lunar soil layers. The drill was then rolled up into a sample container about the size of a basketball. The Luna 24 spacecraft blasted off the Moon on Aug. 19, and the sample chamber landed safely on Aug. 22, in western Siberia. The core is now being studied in the Vernadsky Institute of Geochemistry and Analytical Chemistry in Moscow, the Soviet Union's leading geoscientific center and repository for their lunar samples.

Besides Dr. Duke, members of the American scientific delegation who were in Moscow this week to examine the Luna 24 core are Prof. Gerald J. Wasserburg of the California Institute of Technology and Dr. Charles Simonds of the Lunar Science Institute in Houston.

Russian scientists have been invited to describe their analyses of the Luna 24 samples at the Eighth Annual Lunar Science Conference, to be held in March in Houston. These conferences, which have been held yearly since the first Moon rocks were obtained by the Apollo program in 1969, are a major event in the presentation of lunar and planetary science results.

- more -

The agreement under which the American and Russian lunar samples are exchanged was negotiated between NASA and the U.S.S.R. Academy of Sciences in 1971. Already analyzed by American scientists have been samples from the Russian Luna 16 and Luna 20 probes, which returned material from the Moon in 1970 and 1972. The agreement also provides for the exchange of lunar scientific data between Russian and American scientists and for scientific visits between the two countries. The agreement also provides for the future exchange of lunar samples.

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December 17, 1976

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 76-79

December 22, 1976
2:00 p.m. CST

JSC EXTENDS LOCKHEED COMPUTING SUPPORT CONTRACT

The NASA Johnson Space Center has signed a contract with Lockheed Electronics Company, Inc. for engineering, scientific and computing center support services at the Houston Center.

Services performed at JSC include computing center support for Space Shuttle, Large Area Crop Inventory Experiment (LACIE), and the Earth Resources Aircraft Program. The cost-plus-award-fee contract is valued at approximately \$29.9 million.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 76-80

December 30, 1976
12:15 P.M. CST

JSC EXTENDS BOEING SAFETY, RELIABILITY CONTRACT

The NASA Johnson Space Center has extended for two years a contract with The Boeing Company for safety, reliability and quality assurance engineering support at the Center. Boeing's tasks under the contract involve current and future space vehicle programs, ground support equipment, facilities and payloads including experiments.

The \$11,090,929 extension brings the estimated value of the cost-plus-award-fee contract to \$19,874,827.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

RELEASE NO: 77-09

For Release:

Upon Receipt

February 9, 1977

EIGHTH ANNUAL LUNAR SCIENCE CONFERENCE MARCH 14 - 18

The Johnson Space Center and the Lunar Science Institute will host the 8th annual Lunar Science Conference, March 14 through 18, at the space center in Houston. More than 600 scientists from around the world are expected to attend.

New information gained about the moon from a wide variety of scientific studies of lunar samples and data obtained from Apollo surface and orbital experiments, and new interpretations and refinements of previous models of lunar origin and history will be presented at the conference.

This eighth consecutive lunar science meeting is also the second "planetary" science meeting, continuing a trend begun at last year's conference where topics of planetary interest were introduced for the first time.

- more -



The conference was expanded to include the planets last year because of the accumulating data from the recent NASA and Soviet exploratory missions to Venus, Mercury, Mars and the outer planets which provide important data on planetary origin and evolution, which is of primary concern to lunar scientists.

This year's conference will include papers based on the recent exploration of Mars by the Viking spacecraft.

Also at this year's conference the Soviet Union will present lunar material from their recent Luna 24 mission to NASA scientists for examination and analysis.

A delegation of Soviet scientists will present five half-gram-size samples retrieved by the Luna 24 spacecraft last August. Two samples from the Luna 24 mission are already at the Johnson Space Center Lunar Curatorial Facility. They were presented to the agency this past December at ceremonies in Moscow. The Luna 24 samples represent material from the easternmost limb of the moon, an area not previously sampled by either the U.S. Apollo program or the U.S.S.R. Luna program.

The scientific topics to be considered at this eighth conference are:

Constraints on structure and composition of

Planetary interiors.

Characteristics and movements of materials on

lunar, planetary and asteroidal surfaces.

Characterization and evolution of maria and other
volcanic landforms.

- more -

Characterization and evolution of planetary
crusts.

Nature and effects of impact processes.

Extraterrestrial materials as solar/interplanetary/
interstellar probes.

Earliest history of the solar system.

The conference will open with a general session followed by four days of concurrent sessions concerning the various topics outlined. A summary session will be presented on Friday, March 18.

Conference co-chairmen are Dr. Michael Duke, Acting Chief, Lunar and Planetary Sciences Division, JSC, and Dr. Robert Pepin, outgoing Director, Lunar Science Institute.

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Editor's Note:

Reporters wishing to cover the conference should report to the News Center, Building 2, Johnson Space Center (713/483-5111). Conference personnel will not accredit newsmen. A summary press conference is planned following the summary session on Friday. Transcripts of the summary session, press conference, and any special sessions scheduled will be made available to media about 4 weeks following the conference.

For further information please contact Johnson Space Center, Public Information Office, (713) 483-5111.

February 9, 1977

NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Janet Wrather

For Release:

RELEASE NO: 77-10

Upon Receipt

February 24, 1977

NASA SYMPOSIUM '77 TO BE HELD AT THE JOHNSON SPACE CENTER

More than 2000 students from Texas junior and senior high schools will gather at the Johnson Space Center, March 1-3, to participate in "NASA Symposium '77."

A first-of-its-kind event for NASA, the symposium is designed to motivate youth -- particularly female and minority students -- to seek engineering and science careers.

Some 700 students and counselors from school districts in 17 Texas cities are expected to attend each day of the event.

JSC and contractor employees will conduct workshops and will discuss their own careers as scientists or engineers. Tours of various work areas are also planned.

"Hopefully, the use of center employees as 'role models' will serve as an effective motivating factor for the students," stated Joseph Atkinson, Chief of the Equal Employment Opportunity Office.

- more -



A special guest at the symposium will be actress Nichelle Nichols of the Star Trek television series.

Themes for the symposium include: Space Research Activities -- Past, Present, Future; Space Technology -- Its Practical Applications and Benefits; NASA's Research and Development Program; Motivating Minorities and Women Into Science and Engineering Careers; and Future Careers in Science, Engineering and Technology.

Administrators from colleges and universities which enroll high percentages of minority and female students have been invited to attend a seminar during the symposium concerning NASA's research, training and employment opportunities. The information they receive will be passed on to their students.

Symposium activities will take place in the Buildings 2 and 30 auditoriums, the Gilruth Center and appropriate job-site areas.

Awards will be given to students who submitted outstanding science papers prior to the symposium. The papers are being judged by professional scientists and engineers.

Programs similar to Symposium '77 have been held in the past at three universities. This will be the first time NASA has sponsored one of the events at a field center. A similar symposium has been scheduled at Kennedy Space Center, Florida.

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February 24, 1977

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release

RELEASE NO: 77-14

Upon Receipt

EUROPEAN INNOVATION COULD ASSIST SPACE SHUTTLE EXPERIMENTERS

In a novel twist to an old story, the space agency stands to benefit from an industrial innovation. Spin-offs usually come from, rather than go to, the National Aeronautics and Space Administration.

This particular industrial spin-off is a European innovation establishing standards for electronic subassemblies used between computers and scientific hardware. The standards, known as CAMAC, have been used in Europe for over six years and have resulted in tremendous cost savings for European university and industrial experimenters.

At the Johnson Space Center, Houston, equipment built to CAMAC standards has been used for six years in scientific experiments flown aboard high-altitude balloons. The CAMAC equipment has performed satisfactorily at great reductions in cost over previously-used custom-built electronic assemblies.



Cost savings are envisioned during the 1980 Shuttle era by which time experimenters from many different American universities and companies will share Shuttle Orbiter space with European experimenters.

The CAMAC equipment would provide data and control links between the Shuttle Orbiter computers and experiment hardware in the payload bay. Experimenters would be able to cut experiment costs since major electronics sections would be assembled from a CAMAC subassembly pool. Experiments with common subassemblies would be able to share spare parts, thereby reducing the cost of reliability.

The CAMAC equipment has been shown to be compatible with the "shirt sleeve" environment aboard the Orbiter. The Marshall Space Flight Center, Huntsville, Alabama, is currently examining different CAMAC equipment to determine reliability during the stresses of launch and landing.

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March 7, 1977

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release

RELEASE NO: 77-15

Upon Receipt

WILDLAND INVENTORY EXPERIMENT BEGUN BY NASA & BLM

The National Aeronautics and Space Administration and the Department of the Interior have begun preliminary work on an experiment involving the remote sensing of wildland resources in the western United States.

Interior's Bureau of Land Management (BLM) and NASA's Johnson Space Center (JSC) have identified joint responsibilities for the cooperative experiment which will test and implement a system using Landsat satellite information to provide the BLM with an inventory of major streams, soil and vegetation types, drainage patterns, major lakes, ponds, and other reservoirs, and fire occurrence and hazards.

Landsat is an Earth resources satellite which provides multispectral information capable of being computer enhanced and processed. It orbits the Earth at an altitude of 570 miles. Two Landsat satellites are presently in orbit with a third due for launch this October.

- more -



NASA will provide satellite data and sophisticated processing techniques to extract inventory information from the data. Most of the NASA share of the experiment will be done at the space center in Houston.

The experiment will concentrate first on a portion of southcentral Alaska east of Mount McKinley National Park. The area is called the Denali Planning Unit by the BLM and includes northern spruce and fir trees in a tundra ecology.

The second phase, if approved, will concentrate on the Shiwits Planning Unit, an area in northwestern Arizona representing a desert ecology. The final phase of the experiment will cover the Owyhee Planning Unit in southwestern Idaho representing the sagebrush and grassland community of the intermountain west.

Each phase of the experiment will last about one year. At the completion of the experiment, now expected to be late 1979, the partners expect to have developed an automated inventory system capable of providing extensive, timely information about the BLM's land holdings.

This experiment is a continuation of NASA's applications program in the Earth resources disciplines. Previous applications which NASA has developed for other agencies and private concerns include a water mapping system for the Corps of Engineers, a forest inventory system for the U.S. Forest Service, and a coastal wetlands inventory system for the State of Louisiana, all using Landsat information. The applications program aims to transfer the technology gathered during these experiments to all possible public users.

- more -

The Bureau of Land Management is an agency of the U.S. Department of the Interior which has broad management authority over 473 million acres of land in 11 western states including over two-thirds of Alaska. The BLM was recently granted the authority to inventory public lands and to prepare comprehensive land-use programs for the lands held in public trust under the BLM's stewardship.

The Johnson Space Center is NASA's lead center for the development of earth resources applications programs.

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March 7, 1977

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Jack Riley

For Release:

RELEASE NO: 77-16

March 4, 1977
2:00 p.m. CST

GIBSON REJOINS ASTRONAUT OFFICE

Dr. Edward G. Gibson, science pilot on the 84-day Skylab 4 mission in 1973-74, will rejoin the Johnson Space Center's Astronaut Office on Monday, March 7.

Gibson, 40, resigned from NASA in December 1974, to become a senior staff scientist at Aerospace Corp., El Segundo, California. In 1976, he joined ERNO, Bremen, West Germany, prime contractor for Spacelab which will fly aboard the Space Shuttle.

He will be assigned to the Mission Specialist Office, headed by Astronaut Joseph P. Kerwin, MD. Gibson's Ph.D. degree is in engineering and physics.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Jack Riley

For Release

March 8, 1977

RELEASE NO: 77-17

ASTRONAUT EVANS TO LEAVE NASA

Astronaut Ronald E. Evans will leave NASA March 15 to become a coal industry executive.

Evans, 43, command module pilot of Apollo 17 in 1972, has been named Executive Vice President of Western America Energy Corporation and Director of Marketing for WES-PAC Energy, the coal producing concern of WAEC. Headquarters is in Scottsdale, Arizona, where the Evans family will reside.

"I really appreciate the opportunity I've had to participate in this nation's space program, and I'd like to thank everyone involved for their help to me and in making the program a success," he said.

Evans was selected as a NASA astronaut in 1966. He logged 301 hours and 51 minutes in space during Apollo 17's mission to the moon, including a one-hour, six-minute "space walk." He was a member of the astronaut support crews for Apollos 7 and 11 and was backup command

-more-



module pilot for Apollo 14 and the Apollo-Soyuz Test Project.

He retired from the Navy as a captain in May 1976, but remained in the astronaut corps where he has been responsible for the operational aspects of the ascent phase of the Space Shuttle orbital flight tests scheduled to begin in 1979.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 77-18

March 7, 1977
2:00 p.m. CST

HAMILTON STANDARD GETS SHUTTLE OXYGEN SYSTEM CONTRACT

The NASA Johnson Space Center, Houston, Texas, has awarded Hamilton Standard Division of United Technologies Corporation, Windsor Locks, Connecticut, a contract for development and production of the Space Shuttle portable oxygen system.

The system consists of a face mask, rebreather loop, heat exchanger, oxygen bottle and recharge kit which can operate independently or connected to the Shuttle Orbiter's oxygen system. Orbiter crew and passengers will use the portable oxygen system for emergency oxygen in case of cabin atmosphere contamination, for prebreathing prior to spacewalks for denitrogenizing crewmen's circulatory systems, life support during rescue operations, and emergency oxygen after landing if the atmosphere around Orbiter is contaminated.

The cost-plus-fixed-fee contract is valued at \$2,752,000.

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NASA-JSC

NASA News

National Aeronautics and
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3084

Charles Redmond

For Release:

RELEASE NO: 77-20

Upon Receipt

CONSTRUCTION BEGUN ON NEW LUNAR SAMPLE BUILDING

Construction for the Johnson Space Center's new Lunar Curatorial Facility began Monday, March 14. The new facility will replace the presently crowded facility in Building 31.

General contractor for the construction is Spaw-Glass, Inc., of Houston. Construction is expected to be completed by September 1978. Construction budget is \$2.02 million. A special feature of the new facility is a glass viewing area on the second floor so clean-room operations can be viewed from outside the clean area.

The new facility will be a 14,000-square-foot two-story addition to Building 31. It will provide clean, secure storage space, processing, experimental and simulation labs for the samples.

NASA astronauts brought back from the moon ^{480 Kg} 844.1 pounds of material. One hundred twenty-one pounds of it is in back-up storage in San Antonio, and the remainder is stored at JSC. In addition to American lunar samples, the Curatorial Facility also houses a small collection of lunar material provided by the USSR Academy of Sciences from the Soviet Luna exploration program.

APR 15/77

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

✓ (M)

Terry White

RELEASE NO: 77-26

For Release:

April 15, 1977
2 p.m. CST

NASA AMENDS ROCKWELL CONTRACT TO COVER ORBITER CHANGES

The NASA Johnson Space Center, Houston, has signed a supplemental agreement to the contract with Rockwell International Corporation Space Division, Downey, California, covering eight engineering changes to the Space Shuttle Orbiter. The changes include incorporation of windows in both the Orbiter airlock and in the payload tunnel adapter, and other adaptations for the European-built Spacelab to be carried into space in Orbiter's 15 x 65 ft. cargo bay.

The supplemental agreement is valued at \$5,189,500, bringing the estimated value of the cost-plus-award-fee Rockwell contract to \$3,047,370,853.

Rockwell performs the bulk of the Orbiter work at its Downey plant with support from field offices in Houston and at NASA Kennedy Space Center, Florida.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

APR 22/77

Terry White

For Release

April 22, 1977

Release No.: 77- 27

SPACE ENGINEERS DESIGN

EMERGENCY MEDICAL CONSOLE

Out in West Texas, where there is nothing but "miles and miles of miles and miles," physicians and nurses have better things to do than to figure out how to "patch" an incoming ambulance radio call into a hospital phone system. Most attempts at wiring together radio and telephone communications between a central hospital and on-scene ambulance paramedics usually resemble yesterday's spaghetti.

Communications and biomedical engineers at the NASA Johnson Space Center in Houston have designed and built a prototype emergency services communications unit which has been installed in the Odessa Medical Center Hospital. The hospital is one of several medical facilities in the Permian Basin Emergency Medical System, and is the medical "control center" for the 17-county system.

The communications console, scarcely larger than an electric typewriter, was built from commercially-available components and includes all emergency medical system (EMS) communications functions that are needed for a regional hospital. In the radio section of the console, easy-to-operate controls allow a physician or nurse to consult with local or regional ambulance drivers and paramedics, other hospitals, receive incoming electrocardiograms, set up a radio-to-telephone patch, and

- more -

page hospital staff members. The telephone system includes a hotline from the Emergency Medical System's resource control center, an automatic dialer for special-care centers and other facilities in the Permian Basin network, incoming or outgoing electrocardiographic data for cardioscope displays and strip recorders between hospitals, and a hospital intercom terminal.

After several months of field testing in the Odessa Hospital, NASA engineers will make whatever design changes are needed to the console.

Complete sets of design and manufacturing drawings for the console are expected to be available to EMS organizations by May 30, 1977 from the Technology Utilization Office, NASA Johnson Space Center, Houston, Texas 77058. EMS groups would then contract locally for construction of consoles fitting their specific needs.

- end -

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

RELEASE NO: 77-32

For Release

May 13, 1977

SPACELAB MEDICAL SIMULATION STARTS AT JOHNSON SPACE CENTER

Three life sciences specialists Tuesday will close the hatch behind them for a seven-day simulation of a typical Spacelab mission to be hauled into space in the 1980's aboard the Space Shuttle.

Astronaut-physician Dr. William E. Thornton, mission specialist, Dr. Carter Alexander, payload specialist, both of NASA Johnson Space Center, Houston; and payload specialist Dr. Bill A. Williams of NASA Ames Research Center, Mountainview, California, will live aboard a high-fidelity mockup of the Spacelab and the Shuttle Orbiter crew deck during the week-long Life Sciences Spacelab Mission Development Test III. Similar tests were held at Johnson Space Center in October 1974 and January 1976.

- more -

Spacelab is under development by a consortium of ten European nations and will be carried into space in Shuttle Orbiter's 15 x 65-foot payload bay. A wide range of scientific, medical and engineering experiments will be flown aboard each Spacelab mission.

Spacelab life sciences payloads, similar to the developmental experiments in the week-long simulation, will be aimed toward determining the effects of the space environment on living organisms while at the same time improving space crew health care during future space exploration missions. Additionally, the payloads will be used to develop life support systems for people living and working in space and applications of space technology toward clinical research and health care on Earth.

Medical monitoring and health services for the Spacelab simulation crew will be provided by Dr. Thornton.

A "rack" of 20 life sciences experiments was developed and built at the Ames Research Center and shipped to Houston for the simulation. An additional six Johnson Space Center experiments will be run during the seven days of the test in JSC's Bioengineering and Test Support Facility.

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NASA News

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Milt Reim

RELEASE NO: 77-39

For Release

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July 15, 1977

OVER 8,000 APPLY FOR SPACE SHUTTLE ASTRONAUT PROGRAM AT JSC

Over 8,000 individuals have applied for the 30 to 40 positions the National Aeronautics and Space Administration has opened for Space Shuttle astronaut candidates.

To be eligible, applications had to be postmarked prior to midnight June 30. Many waited until the last day to apply and total application numbers are still being tallied.

The astronaut selection board at the Johnson Space Center in Houston is now in the process of narrowing the selection to those best qualified in each category. From these, approximately 150 applicants will be selected for preliminary screening and physicals at JSC.

Thirty to 40 candidates will be accepted for a two-year training and evaluation period at JSC. Pilot and mission specialist candidates will be notified of their selection by December.

The candidates will report for duty at JSC in Houston in 1978. Final selection as an astronaut will depend on satisfactory completion of the evaluation period.

- more -

The latest tally indicates that 8,037 men and women applied for the astronaut program. The mission specialist category had 6,735 applicants and the pilot category had 1,302 applicants.

A total of 24,618 inquiries were received after the program was announced a year ago, and of these 20,440 requested and were sent application packets.

Women applicants for the two positions numbered 1,142.

Pay for civilian candidates will be based on the Federal Government's General Schedule for pay scale from grades GS-7 through GS-15, with approximate salaries from \$11,000 to \$34,000 per year. Candidates will be compensated based on individual academic achievements and experience. Other benefits include vacation and sick leave and participation in the Federal Government retirement, group health and life insurance plans.

Military candidates will be assigned to JSC but will remain in active military status for pay, benefits, leave and other military matters.

Currently, 30 persons are available as Space Shuttle crewmen, including 10 scientists. Twenty-seven of them are astronauts assigned to the Johnson Space Center and three hold government positions in Washington, D.C.

The Space Shuttle is a reusable vehicle that will replace virtually all of this nation's space launch vehicles. Space missions could include deploying and retrieving satellites, servicing satellites in orbit, operating laboratories for astronomy, earth sciences, space processing and manufacturing, and developing and servicing a permanent space station.

- more -

Launched like a rocket, the Shuttle will perform earth orbital missions of up to 30 days, then land like an airplane and be refurbished for another mission. Pilot astronauts will control the Shuttle during launch, orbital maneuvers and landings and be responsible for maintaining vehicle systems. Mission specialist astronauts will be responsible for the coordination of overall Orbiter operations in the areas of flight planning, consumables usage and other activities affecting payload operations. At the discretion of the payload sponsor, the mission specialist may assist in the management of payload operations, and may, in specific cases, serve as the payload specialist. They will be able to continue in their chosen fields of research and to propose, develop and conduct experiments.

Crews will consist of a commander, a pilot and may include a mission specialist and payload specialists. Payload specialists need not be NASA employees.

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NASA News

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Robert V. Gordon

For Release:
Immediate

RELEASE NO: 77-41

THIRD MANNED CAPTIVE FLIGHT OF SHUTTLE ORBITER SCHEDULED

The third manned flight of NASA's Space Shuttle Orbiter "Enterprise" atop its 747 carrier aircraft now is scheduled for no earlier than July 26, at the NASA Dryden Flight Research Center, Edwards, California. Takeoff time of the 747/Orbiter is planned for 8 a.m. PDT.

Astronauts Fred W. Haise and C. Gordon Fullerton will be at the controls of the Orbiter during the 55-minute captive test flight which is a full dress rehearsal for next month's first free flight of the Orbiter. If flight and test objectives are successfully accomplished, the first free flight will be no earlier than August 12.

This is the second flight for Haise and Fullerton. Their first flight was June 18.

Astronauts Joe Engle and Richard Truly were the Orbiter pilots during the captive flight June 28.

The 747 will carry the Orbiter to a maximum altitude of 7,895 meters (25,905 feet) when the 747 will push over in a practice run of Orbiter-747 separation. The Orbiter and 747 crews will perform all of the functions

-more-

RELEASE NO: 77-41

Page 2

up to but not including actual separation. The 747/Orbiter will land at Edwards about 10 minutes after the pushover maneuver.

The 747/Orbiter combination will make one circuit of the 135 by 39 kilometer (84 by 24 mile) "racetrack".

The two previous manned captive flights met all test objectives. The first flight, which lasted 56 minutes, was a low altitude and low speed flight during which time flight control systems and Orbiter controls were tested by Haise and Fullerton. Engle and Truly reported everything went well during their 63 minute flight, which reached an altitude of 6,278m (20,600 ft.) and a top speed of 500 km/hr (310 mph).

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July 21, 1977

THIRD MANNED CAPTIVE FLIGHT

<u>Event</u>	<u>Altitude</u>	<u>T-Time*</u>	<u>PDT a.m.</u>	<u>EDT</u>
Crew Wakeup		T-240	4:00	7:00
Crew Depart VOQ		T-210	4:30	7:30
Crew Arrives Trailer (physical & breakfast)		T-195	4:45	7:45
Crew Departs for Suitup		T-160	5:20	8:20
Crew Departs Trailer		T-125	5:55	8:55
Start Ingress		T-120	6:00	9:00
Ingress Complete		T-98	6:22	9:22
ALT Ground Team/Flight Team Handover		T-67	6:53	9:53
Orbiter/SCA Move From MDD		T-62	6:58	9:58
Orbiter/SCA Tow to NASA Ramp		T-56	7:04	10:04
SCA Engine Start		T-42	7:18	10:18
SCA Begin Taxi		T-32	7:28	10:28
SCA Arrive Runway		T-12	7:48	10:48
Navigation Update		T-4	7:56	10:56
SCA Brake Release, Takeoff, Climbout		T-0	8:00	11:00
Intersect Racetrack	16,905 (AGL)**	+13	8:13	11:13
In-Flight FCS Checks	22,705	+24	8:24	11:24
Reach MCT 200 FPM Ceiling	23,605	+28	8:28	11:28
SCA Begin SRT	24,705	+36	8:36	11:36
Pushover (Practice Separation)	25,905	+45	8:45	11:45
SCA Touchdown		+55	8:55	11:55
Deploy Landing (Orbiter) During SCA Rollout				

Note

* Events and times are preliminary and may change prior to flight day.

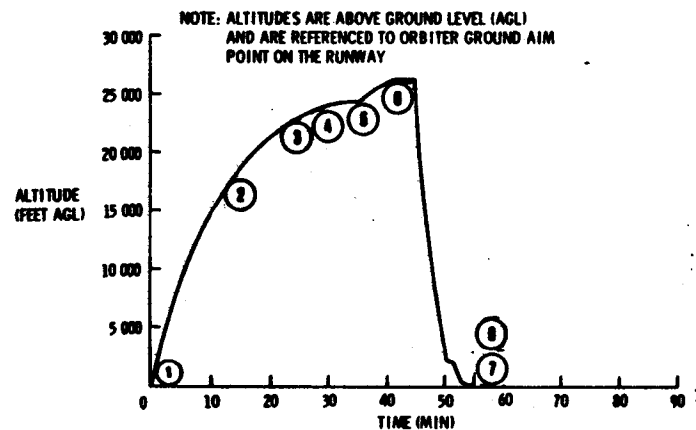
** Altitudes are above Ground Level (AGL) and are referenced to Orbiter ground aim point on the runway. Add 2,300 ft. to AGL to obtain altitude above Mean Sea Level (MSL).

MATED PROFILE CAPTIVE ACTIVE 3

FLIGHT SEQUENCE

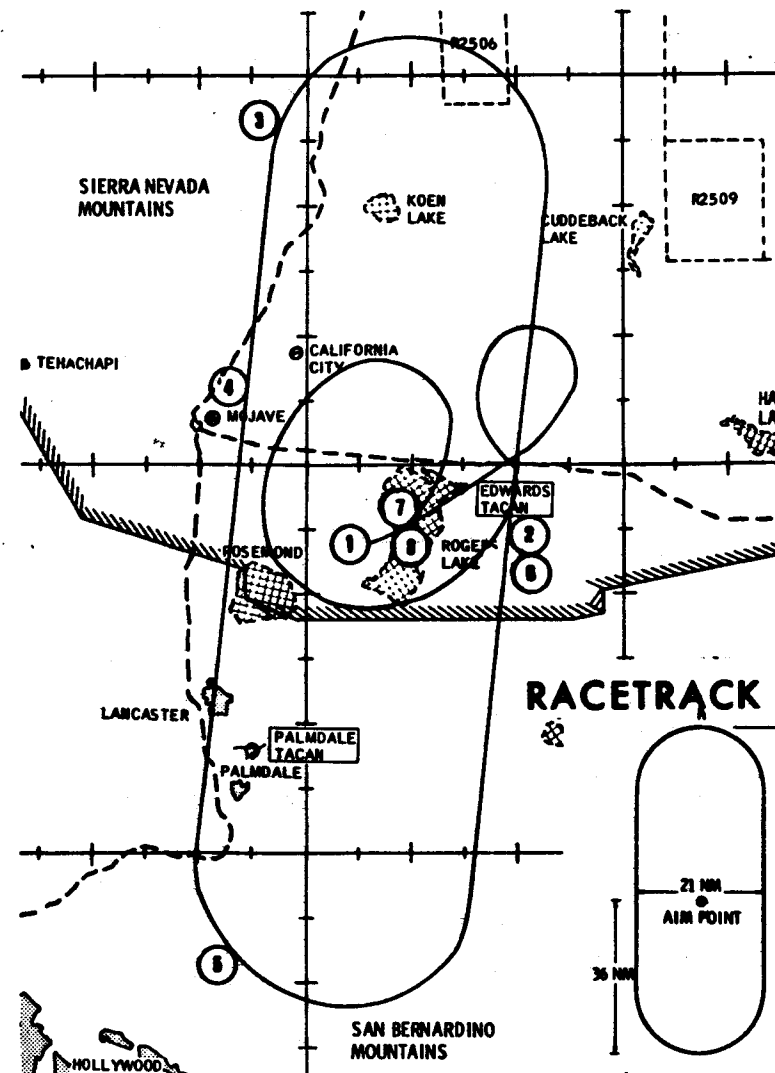
ITEM	TIME (MIN)	ALTITUDE (FEET AGL)	RANGE (NM)	EVENT
①	0	0	0	SCA TAKEOFF
②	13	16 905	12	INTERSECT RACETRACK
③	24	22 705	26	IN-FLIGHT FCS CHECKS
④	28	23 605	16	REACH MCT 200 FPM CEILING
⑤	36	24 705	29	SCA BEGIN SRT
⑥	45	25 905	9.5	PUSHOVER (PRACTICE SEP)
⑦	55	0	0	SCA TOUCHDOWN
⑧	55.5	0	0	DEPLOY LANDING GEAR DURING SCA ROLLOUT AT ~125 KCAS

ALTITUDE PROFILE



NASA-JSC

GROUNDTRACK



A

DATE 06/27/77

OVERVIEW

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Charles Redmond

For Release

RELEASE NO: 77-43

August 4, 1977

NOTE TO EDITORS

SUMMER WORKSHOP ON NEAR EARTH RESOURCES TO BE HELD AUGUST 6-13, 1977

A summer workshop on Near Earth Resources to discuss the possible scientific and technological exploitation of lunar and asteroidal materials will be held at the University of California at San Diego from August 6 through 13.

Participants for the workshop have been chosen already and represent a cross-section of geo-scientists and geo-engineers from government, private industry and the university community.

Purpose of the workshop will be to explore present lunar and asteroidal knowledge to determine the level of our understanding. Gaps in this knowledge will be examined to ascertain the importance of finding the answer. The technological and scientific utilization of lunar and asteroidal materials also will be discussed. The group will be working towards recommendations concerning what research should be attempted and what exploitation can be accomplished.

Lunar researcher and UC professor Dr. James Arnold is chairman of the workshop committee and will present the group's recommendations to NASA Office of Space Science officials at the conclusion of the workshop.

Recommendations of the workshop will be used as a step in providing the Office of Space Science with a logical and useful rationale for scientific and technological follow-up to the previous decade's extra-terrestrial exploration.

- more -

A press conference will be held at 1 p.m., Saturday, August 13, in Urey Hall at UC/San Diego. Copies of the list of recommendations will be made available to members of the press.

For further information:

La Jolla, California

Florence Kirchner 714 452-2909 or 3575

Paul Lowenburg 714 452-3120

Houston, Texas

Charles Redmond 713 483-5111

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NASA News

National Aeronautics and
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Milton Reim

For Release
August 11, 1977

RELEASE NO: 77-44

SECOND GROUP OF ASTRONAUT APPLICANTS TO BE INTERVIEWED

The second group of 20 Space Shuttle astronaut applicants to be selected for individual interviews and physical examinations will report to the Johnson Space Center, Monday, August 15.

Approximately 200 of the 8,079 who applied for the astronaut program will be coming to JSC for further screening. Women and minorities will be among those chosen for screening here at JSC.

This second group, like the first group are all pilots. They will be at JSC for one week. The selection process is expected to be complete by mid-November.

In December, NASA will select as many as 20 astronaut candidates in each of the two categories -- pilot and mission specialist. Reporting date for the candidates will be in mid-1978. Satisfactory completion of a two year training and evaluation period will be a requirement for final selection as an astronaut.

The names, place of birth, high school (HS), and current duty station of the second group of 20 applicants selected for further screening are:

-more-

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Lt. Col. Leslie B. Anderson, III, 36, USAF
Wooster, Ohio; - HS: Winter Haven, Florida
436th Tactical Fighter Training Squadron, Holloman AFB, NM

Capt. Richard S. Couch, 31, USAF
Hamilton, Ontario, Canada; - HS: Texarkana, Arkansas
4950th Test Wing, Wright-Patterson AFB, OH

Major Richard O. Covey, 31, USAF
Fayetteville, Arkansas; - HS: Shalimar, Florida
AFFTC, Detachment 2, Eglin AFB, FL

Capt. Dale S. Elliott, 32, USAF
Lake Charles, Louisiana; - HS: Burlingame, CA
3246th Test Wing, Eglin AFB, FL

Lt. Robert L. Gibson, 30, USN
Cooperstown, New York; - HS: Huntington, New York
Strike Aircraft Test Directorate Fighter Branch, Naval Air Test
Center, Patuxent River, MD

Capt. Ronald J. Grabe, 32, USAF
New York, New York; HS: New York, New York
USAF/RAF Exchange Program, Amesbury, Wiltshire, England

Stanley D. Griggs, 37, Civilian
Portland, Oregon; - HS: Portland, Oregon
CC52/Johnson Space Center, Houston, TX

Major James G. Hart, 35, USMC
Minneapolis, Minnesota; - HS: Faribault, Minnesota
Air Test & Evaluation Squadron 5, Naval Air Facility, China Lake, CA

Lt. Cmdr. William B. Hayden, 32, USN
Oakland, California; - HS: Rockville, Maryland
Fighter Squadron 14, Naval Air Station Oceana, Virginia Beach, VA

Lt. David T. Hunter, 29, USN
Tacoma Park, Maryland; - HS: Marietta, Georgia
Strike Aircraft Test Directorate, Naval Air Test Center, Code SY90
Patuxent River, MD

Major Jack M. Jannarone, 34, USAF
Ft. Gordon, Georgia; - HS: Highland Falls, New York
6512th Test Squadron/DOTF, Fighter Branch, Edwards AFB, CA

-more-

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page 3

Major Don E. Kenne, 35, USAF
Baltimore, Maryland; - HS: Dayton, Ohio
475th Test Squadron, Air Defense Weapons Center, Tyndall AFB, FL

Capt. Kerry E. Killebrew, 30, USAF
Murray, Kentucky; - HS: Memphis, Tennessee
6512th Test Squadron/DOTF, Fighter Branch, Edwards AFB, CA

Major James R. Klein, 35, USAF
Dubuque, Iowa; - HS: Cedar Rapids, Iowa
USAF Test Pilot School, Edwards AFB, CA

Lt. Joseph F. Lucey, 31, USN
Minneapolis, Minnesota; - HS: Minneapolis, Minnesota
Strike Aircraft Test Directorate Fighter Branch, Naval Air Test
Center, Patuxent River, MD

Lt. Cmdr. John M. Luecke, 33, USN
Macomb, Illinois; - HS: Freeport, Illinois
Box 84, COM NAV ACTS UK, FPO New York

Lt. Cmdr. Jon A. McBride, 33, USN
Charlestown, West Virginia; - HS: Beckley, West Virginia
Air Test & Evaluation Squadron 4, Point Mugu, CA

Lt. Cmdr. Charles R. McRae, 33, USN
Miami, Florida; - HS: Miami, Florida
Strike Aircraft Test Directorate, Naval Air Test Center
Patuxent River, MD

Capt. Michael D. Marks, 34, USAF
Salt Lake City, Utah; - HS: Hazelwood, Missouri
Air Force Flight Test Center/DOVA, Edwards AFB, CA

Capt. Marvin L. Martin, 30, USAF
Nevada, Missouri; - HS: Nevada, Missouri
USAF Test Pilot School, Edwards AFB, CA

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Terry White

For Release

RELEASE NO: 77-45

August 9, 1977
3:00 p.m. CDT

LOCKHEED AWARDED CONTRACT FOR TECHNICAL SUPPORT SERVICES

Lockheed Electronics Company, Inc., 16811 El Camino Real, Houston, Texas 77058, has been awarded a contract for technical support services for the Earth Resources Laboratory at the Slide11 Computer Complex, Slide11, Louisiana.

Lockheed will furnish all personnel, including management and staff, necessary to support operation and maintenance of four laboratories: Data Acquisition Laboratory, Data Systems Laboratory, Data Processing Laboratory, and Data Preparation Laboratory.

The contract is a cost-plus-award-fee type contract and is awarded for a 24-month period beginning August 1, 1977, and ending July 31, 1979. The contractor will employ approximately 80 persons, and the estimated amount of the contract is \$4,004,715.

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NASA-JSC

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Free Aug. 23-26

Charles Redmond

For Release:

RELEASE NO: 77-47

Upon Receipt
Sept 1, 1977

LUNAR SCIENCE STATIONS TO CEASE FUNCTIONING SEPTEMBER 30

On September 30, against the backdrop of a waning moon, science instruments on the lunar surface will be turned off and the ALSEP (Apollo Lunar Surface Experiments Package) control center at NASA's Johnson Space Center, Houston, will be dismantled.

The Apollo lunar science stations will be shut down because of dwindling power reserves at the stations and budgetary limitations here on Earth.

Since July 20, 1969, scientists on Earth have been receiving a continuous stream of information about the Moon, from the Moon. For the past eight years much of what has been learned about the Moon has been sent by the five ALSEP's left on the Moon's surface by the Apollo explorers.

There are five operating stations, one each for Apollo missions 12, 14, 15, 16 and 17. The Apollo 11 crew placed a prototype station on the Moon in July 1969. That first station, with a design life of only 14 days, lasted 45 days and quit due to power supply failure. The remaining five Apollo stations have been nothing short of tenacious. Specifications called for a one-year operating life for the first four ALSEP's and two years for the Apollo 17 station. Apollo 12

- more -

ALSEP is now well into its eighth year and Apollo 17 ALSEP its fifth year. Over 153,000 commands have been transmitted from Earth and executed by the moon stations. More than one trillion (10^{12}) bits of lunar science and engineering data have been received on Earth. The total accumulated operating time for all ALSEP stations exceeds 29 years, this for equipment designed for a cumulative total of only six years. The extended life is attributed to the high reliability required for the first year's operation.

The stations were built to provide long-term lunar surface geophysical and electrical data. The surface experiments included measuring the heat produced by the Moon's interior, the kind and amount of charged particles in the Moon's tenuous ion atmosphere, measuring the magnetic environment, and most importantly of all, measuring and providing seismic data on moonquakes and meteoroid impacts. Because of the extended life of the ALSEP stations, earth scientists received a real bonus from the science stations, rather than only one or two seismometers operating at any given time, all four seismometers (one each on Apollo 12, 14, 15 and 16) have been operating as a seismic network for the past five years. This network has greatly enhanced the analyses of the few large events which occur each year.

It is the seismic experiments which have intrigued scientists. For eight years seismologists have been awaiting a large meteoroid impact on the Moon's far side. With the information from such an event scientists might finally have been able to answer one of the Moon's most perplexing questions: "What is the deep interior

- more -

of the Moon like and does the Moon have a molten core?"

At the end of this fiscal year the ALSEP stations will be left on their own, all but their transmitters muted. Funding for the technical and scientific support needed to maintain the stations will cease on September 30. The timing is perhaps appropriate, for every day the small radioactive thermoelectric generators which power the stations decay a little more. When next year rolls around there are good odds that at least one of the stations will have so little power only the transmitters could function anyway.

The past eight years have been a time of tremendous increase in the knowledge and understanding about the Moon. The returned lunar samples have played an essential part in this knowledge explosion, but for some aspects of the Moon, only the ALSEP's could have helped. The ALSEP seismic information, magnetometer and heat flow experiments have contributed the principal information about the Moon's interior. It is now believed the Moon's crust is multi-layered and from 60 to 100 km thick with the secondary boundary occurring about 20 km deep. The lunar upper mantle has been determined to be fairly homogeneous and to extend to about 500 km. It is believed to consist of olivine or olivine-pyroxene matter, although other compositions also have been proposed. From 500 km deeper the seismic data indicate the Moon may be iron-enriched, although there is insufficient data to determine whether or not the Moon has a small or molten core.

Moonquakes have been discovered to show periodicity and to recur at several places in the interior. The mechanism for this has been

- more -

hypothesized as release of tidal stress in the region between 1100 and 1500km depth and may occur along possible previously existing faults or local inhomogeneities at depth. The time cycle of the deep-focus moonquakes follows the tidal cycles so closely it appears likely that tidal forces are a major factor in triggering deep-focus moonquakes.

Charged-particle, supra-thermal ion and solar wind experiments have also provided the principal data for a new understanding of the Earth's magnetosphere and the interaction of the magnetosphere with the solar wind. Ion measurements also detected a lunar surface electric potential of about +10 volts in daylight and about -100 (to periodically -250) volts in night. These experiments also provided new information concerning the electrostatic lines of force associated with the transition of the terminator across the lunar surface. The phenomenon is thought to be the result of a cloud of hot solar wind electrons near the terminator (the cloud presumably generated by the limb shock of the solar wind). Extensive lunar soil sputtering resulting from solar wind impingement was also measured by the ALSEP's and further augmented by sample analysis on Earth.

Other questions about the Moon which have not been answered by the Apollo program and the years of subsequent study include where the Moon originated and whether or not there is recoverable water on the planet.

Even though the experiments will be terminated, the transmitters will continue to serve Earth as a reference point in astronomy. The Jet Propulsion Laboratory will continue to use the signals from the

ALSEP transmitters to assist in the Lab's deep space work including geodetic and astrometric studies and spacecraft navigation. Also, the motion of the lunar orbit will be accurately monitored against a background of extra-galactic stars to test gravitational theories.

During the past eight years many of the instruments associated with each ALSEP station have experienced engineering problems. Since July, this year, engineers at JSC have been performing more than their usual maintenance and engineering functions on the ALSEP stations. In preparation for the Sept. first shutdown, the ALSEP stations have been put through a slightly different routine to extract the last ounce of engineering data possible. There are few engineering mysteries still puzzling the JSC team but each station, over the years, has developed a personality and a final understanding of that personality will assist in the design of similar stations. The Moon and Mars are the only planets now equipped with remote sensors, but it is expected that other planets will have them too and a thorough understanding of the harsh environment involved and the effects of time will enhance further the reliability of these devices.

One station in particular, the Apollo 14 ALSEP, has a rather dramatic history of engineering problems. The ALSEP 14 station started working correctly and continued this for four years, then it quit for two days in March 1975, and started up again; then it quit again; then it started up again. This "on-again, off-again" performance was repeated six times in the last two years. The problem has been diagnosed as an intermittent short circuit in one of two power conditioning units.

- more -

The short seems related to the temperature of the unit, in turn related to the position of the Sun over the lunar landscape. It is problems like this, however, that need to be fully understood to insure the proper performance of future generations of remote science stations.

Over the years the ALSEP program has cost \$200 million, including the design and development of the stations themselves, the support engineering work in Houston and the science analysis work performed in dozens of university labs throughout the world. The stations have been costing about \$2 million a year to operate. The program has involved hundreds of engineers and scientists and has produced a tremendous source-bank of information about the Moon, both as a planet and as an object wading through the electric and magnetic environment of the Earth and Sun.

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September 1, 1977

Note

Bendix Aerospace, Ann Arbor, Michigan, was prime contractor for the ALSEP equipment and provided technical support for the JSC control operations.

General Electric furnished the radioisotope thermoelectric generators which provided electric power.

NASA JSC provided project management, operations control and integration; and NASA Goddard provided tracking and communications with the stations.

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Charles Redmond

RELEASE NO: 77-48

For Release:

Upon Receipt

Sept 8, 1977

ALSO RELEASED AT NASA HEADQUARTERS

FIRST SHUTTLE PAYLOAD TO INVESTIGATE EARTH RESOURCES

The first payload to be carried into space by the Space Shuttle will carry out investigations in Earth resources, environmental quality and severe storm research in 1979.

The payload, under management of the NASA Office of Applications, and the Johnson Space Center Space and Life Sciences Directorate, and Earth Resources Program Office, will be on the second Orbital Flight Test (OFT-2) scheduled for launch from the Kennedy Space Center, Florida. Space Shuttle Orbiter 102, sister ship to the "Enterprise" now undergoing Approach and Landing Tests at NASA's Dryden Flight Research Center, California, will make the first several Shuttle space flights.

The Orbital Flight Test program is a series of six developmental missions in 1979 and 1980 leading up to operational readiness of the Space Shuttle in May 1980.

- more -

Objective of the OFT missions is to evaluate the performance of the Space Shuttle and its systems and to provide early demonstrations of the Shuttle's capability to do what it is designed to do in space.

The first orbital Shuttle mission (OFT-1) will carry instrumentation to evaluate its performance and also will carry a special package called the Induced Environment Contamination Monitor (IECM) to measure the effects of the Shuttle on the space immediately around it. The IECM will be carried on all six Orbital Flight Test missions.

The payload carried on the second Shuttle flight, like the Shuttle Orbiter itself, is reusable. This will permit adjustment and modification of the payload instruments and other hardware to allow its use on subsequent flights at relatively low cost.

The first Shuttle payload investigations and the principal investigators as currently assigned are:

- All-Weather Surface Observation Investigation

Principal Investigator - Dr. Charles Elachi,
NASA Jet Propulsion Laboratory, Pasadena, California

For several years NASA research spacecraft have acquired data about Earth resources using space sensors that see in the visible and near infrared portions of the electromagnetic spectrum. This investigation will extend these observations into the microwave portion of the spectrum.

Using an active microwave system (radar), this investigation will add a valuable new dimension to the earlier data and also allow observations through cloud cover. This information will be particularly important

- more -

to mineral exploration and to areas where clouds are present a high percentage of the time. This investigation is also the start of a program to determine the optimum design for active microwave sensors.

- Measurement of Air Pollution from Satellites
Principal Investigator - Dr. Henry H. Reichle, Jr.,
NASA Langley Research Center, Hampton, Virginia

This investigation will measure the amount and circulation of carbon monoxide in the middle and upper troposphere. This will be the first measurement from space of pollutants in the lower atmospheric levels. As such, this investigation is an important step toward measuring and monitoring global pollution where it most directly affects people and communities on Earth.

- Shuttle Multispectral Infrared Radiometer
Principal Investigator - Dr. Alexander F. H. Goetz,
NASA Jet Propulsion Laboratory

This investigation will use a special instrument to provide for testing of various combinations of spectral bands and bandwidths in the near-infrared portion of the spectrum. This allows continued research to optimize infrared sensor systems for future Earth resources satellites. On the OFT-2 mission, this instrument will test spectral bands not now used by the Landsat Earth resources satellite but which appear to have important applications to mineral and oil and gas exploration.

- Ocean Color Experiment
Principal Investigator - Mr. Hongsuk H. Kim,
NASA Goddard Space Flight Center, Greenbelt, Maryland

The bioproductivity of the oceans is an important indicator of the biological health of our planet and the impact of man's activities. It is also of direct interest to commercial fisheries for locating and

evaluating fishing areas. This investigation will attempt to get bioproductivity data by measuring variations in water color in the open oceans. These variations are expected to identify concentrations of chlorophyll as an indicator of the presence of plankton and algae. Such concentrations are feeding ground for many commercially sought fish.

- Nighttime and Daytime Optical Survey of Thunderstorm
Lightning and Convective Behavior
Principal Investigator - Dr. Bernard Vonnegut,
State University of New York at Albany

This investigation will examine the correlation between lightning and various types of severe storms. A standard 16mm movie camera will be used, equipped with a photocell attachment that records lightning flashes as signals on the sound track of the film. This is expected to reveal details of convective circulation in storms and their relationship to the character, location and extent of associated lightning discharges. It is hoped that this data will lead to the development of satellite systems that can identify severe storms day or night.

Payload hardware and science and technical integration and mission support are estimated at approximately \$10 million.

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September 8, 1977

NASA News

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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

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26 SEPT

Milton E. Reim

For Release
Immediate

RELEASE NO: 77-54

FIFTH GROUP OF ASTRONAUT APPLICANTS REPORT TO JSC SEPTEMBER 26

The fifth group of Space Shuttle astronaut applicants is scheduled to be at the Johnson Space Center this week for individual interviews and physical examinations. This group includes pilot and mission specialist applicants.

Seventeen of the twenty are pilot applicants and three are mission specialist applicants.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 for further screening. The final group of applicants is scheduled to report in mid-November.

From the approximately 200 finalists, as many as 20 astronaut candidates will be selected in each category -- pilot and mission specialist. Notification of those selected will be made in December. The astronaut candidates will report to JSC at a later date for a two-year evaluation and training period before their final selection as astronauts.

The names, age, military rank and/or degree, place of birth, high school (HS), and current duty station or place of employment of the individuals in this fifth group are:

-more-

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Norman L. Suits, 39; Lt. Colonel USAF
Chebanse, Illinois; (HS) Moral Township, Indiana
F-15 Joint Test Force, Edwards AFB, California

Bronson W. Sweeney, 33; Major USMC
Fall River, Massachusetts; (HS) Newport, Rhode Island
Naval Air Test Center, Patuxent River, Maryland

Paul D. Tackabury, 32; Captain USAF
Canastota, New York; (HS) Canastota, New York
USAF Flight Test Center, Edwards AFB, California

James W. Tilley II, 34; Captain USAF
Milwaukee, Wisconsin; (HS) Milwaukee, Wisconsin
3246th Test Wing, Eglin AFB, Florida

David M. Walker, 33; LCDR USN
Columbus, Georgia; (HS) Eustis, Florida
NAS Oceana Virginia Beach, Virginia

George J. Webb, Jr., 34; LCDR USN
Jacksonville, Florida; (HS) McLean Virginia
Cecil Field, Florida

Donald E. Williams, 35; LCDR USN
Lafayette, Indiana; (HS) Otterbein, Indiana
NAS, Lemoore, California

Robert C. Williamson, Jr., 31; LCDR USN
West Chester, Pennsylvania; (HS) Alexandria, Virginia
NAS Oceana, Virginia Beach, Virginia

Paul D. Young, 34; Major USMC
Ada, Oklahoma; (HS) Roff, Oklahoma
Fleet Marine Force Pacific (Okinawa)

Steven A. Hawley, 25; Ph.D. (mission specialist)
Ottawa, Kansas; (HS) Salina, Kansas
Cerro Tololo Interamerican Observatory, La Serena, Chile

Gary W. Matthes, 35; Major USAF
St. Louis, Missouri; (HS) Jennings, Missouri
USAF Flight Test Center, Edwards AFB, California

-more-

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Robert L. Oetting, 37; Major USAF
Alton, Illinois; (HS) Wood River, Illinois
USMC Air Station, Cherry Point, North Carolina

Isaac S. Payne, IV; 37; Major USAF
Malakoff, Texas; (HS) Portland, Oregon
Hqs. USAF, The Pentagon, Washington, D.C.

Wilton T. Sanders, III, 29; Ph.D (mission specialist)
Greenwood, Mississippi; (HS) Norfolk, Virginia
Department of Physics, University of Wisconsin, Madison, Wisconsin

Michael E. Sexton, 36; Major USAF
Pendleton, Oregon; (HS) Pendleton, Oregon
36th TAC Fighter Wing F-15 Squadron, Bitberg AFB, Germany

David M. Sjuggerud, 35; LCDR USN
Blair, Wisconsin; (HS) Menomonie, Wisconsin
Naval Air Systems Command, Washington, D.C.

Paul S. Skabo, 35
Dixon, Illinois; (HS) Minot, North Dakota
Federal Aviation Agency, Atlanta, Georgia

James L. Spencer, III, 35; LCDR USN
Charleston, South Carolina; (HS) Quantico, Virginia
Naval Air Test Center, Patuxent River, Maryland

Will R. Stewart, 32; Captain USAF
Montclair, New Jersey; (HS) Nutley, New Jersey
USAF Flight Test Center, Edwards, AFB, California

Joseph J. C. Degioanni, 31, Ph.D., M.D. (mission specialist)
Italy; (HS) Montreal, Canada
Resident, Aerospace Medicine, Johnson Space Center, Houston, Texas

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September 26, 1977

NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Milton E. Reim

For Release

RELEASE NO: 77-59

October 12, 1977

SEVENTH GROUP OF ASTRONAUT APPLICANTS TO REPORT TO JSC OCTOBER 17

Twenty more mission specialist astronaut applicants are scheduled to report to the NASA Johnson Space Center, October 17, for a week of physical examinations and individual interviews. Eight of the group reporting are women.

To date 140 astronaut applicants have been selected to come to JSC for further screening. Of the seven groups reporting, 77 have been pilots and 63 in the mission specialist category. Of the above, 17 are women and all are mission specialist applicants.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 for further screening. Screening of the applicants is expected to be complete by mid-November.

As many as 20 astronaut candidates will be selected in each category---mission specialist and pilot. Those selected will be notified in December. They will report to JSC at a later date for a two-year evaluation and training period. The candidates will become astronauts after satisfactory completion of the two-year period.

The names, age, degrees and/or military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this seventh group are:

- more -

RELEASE NO:

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Jack L. Bufton, 32; Ph.D.

Kenmore, NY; (HS) Warren, PA

NASA/Goddard Space Flight Center, Greenbelt, MD

Samuel H. Clarke, Jr., 40; Ph.D.

Bristol, VA; (HS) Enid, OK

U.S. Geological Survey, Office of Marine Geology, Menlo Park, CA

Kathleen Crane, 26; Ph.D.

Washington, DC; (HS) Falls Church, VA

Scripps Institute of Oceanography, La Jolla, CA

Bonnie J. Dunbar, 28

Sunnyside, WA; (HS) Sunnyside, WA

Rockwell International Space Division, Downey, CA

Brady A. Elliott, 30

Columbus, OH; (HS) North Canton, OH

Texas A&M University (Research Assistant), College Station, TX

Joan J. Fitzpatrick, 27; Ph.D.

Bayonne, NJ; (HS) Bayonne, NJ

Colorado School of Mines Research Institute, Golden, CO

Salvatore Giardina, Jr., 34

Hoboken, NJ; (HS) Union City, NJ

State of Arizona, Oil and Gas Commission, Tempe, AZ

David S. Ginley, 27; Ph.D.

Denver, CO; (HS) Denver, CO

Sandia Laboratories, Albuquerque, NM

Carolyn S. Griner, 32

Granite City, IL; (HS) Winter Park, FL

NASA/Marshall Space Flight Center, Huntsville, AL

Evelyn L. Hu, 30; Ph.D.

New York, NY; (HS) New York, NY

Bell Laboratories, Holmdel, NJ

Carol B. Jenner, 27; Ph.D.

Washington, DC; (HS) O'Fallon, IL

University of Wisconsin, Madison, WI

- more -

RELEASE NO:
page 3

Mary Helen Johnston, 32; Ph.D.
West Palm Beach, FL; (HS) Fort Pierce, FL
NASA/Marshall Space Flight Center, Huntsville, AL

H. Louise Kirkbride, 24
Philadelphia, PA; (HS) Upper Darby, PA
Jet Propulsion Laboratory, Pasadena, CA

Larry A. Mayer, 25
New York, NY; (HS) New York, NY
Scripps Institute of Oceanography, La Jolla, CA

Harry Y. McSween, Jr., 32; Ph.D.
Charlotte, NC; (HS) Clinton, SC
University of Tennessee, Knoxville, TN

Richard W. Newton, 29; Ph.D.
Baytown, TX; (HS) Baytown, TX
Texas A&M University, College Station, TX

William H. Peterson, 36
Brooklyn, NY; (HS) San Francisco, CA
University of Miami (Graduate Research Asst.), Miami, FL

Wayne R. Sand, 36
Conrad, MT; (HS) Valier, MT
University of Wyoming, Laramie, WY

Brian H. Shoemaker, 40; CDR-USN
Noranda, Quebec, Canada; (HS) Bishop, CA
NAS North Island, San Diego, CA

Ritchie S. Straff, 24
Philadelphia, PA; (HS) Ardmore, PA
M.I.T. (Graduate Student), Cambridge, MA

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
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Milton E. Reim
RELEASE NO: 77-66

For Release
October 20, 1977
2:00 p.m. CDT

EIGHTH GROUP OF ASTRONAUT APPLICANTS TO BE AT JSC OCTOBER 25-29

The eighth group of Space Shuttle astronaut applicants is scheduled to report to the NASA Johnson Space Center on Tuesday, October 25 for five days of physical examinations and individual interviews.

Members of this next group are all mission specialist applicants. Nineteen of the applicants are military and one civilian. Services represented are: United States Air Force - 13; United States Army - three; United States Navy - two; and United States Marine Corps - one.

From July 1976, when the program was announced, until June 30, 1977, the application deadline, 8,079 applied for the Space Shuttle astronaut program. Approximately 200 of these applicants are being brought to JSC in groups of 20 for further screening.

Including this group, 160 applicants have been selected to come to JSC for further screening. Of the above, 77 are pilot applicants and 83 are mission specialist applicants.

As many as 20 astronaut candidates will be selected in each category---pilot and mission specialist. Those selected will be notified in December and report to JSC at a later date for a two-year training and evaluation period. The candidates will become astronauts after satisfactory completion of the two-year period.

The names, age, military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this eighth group are:

- more -

RELEASE NO:
page 2

Thomas N. Almojuela, 34; Major USA
Seattle, WA; (HS) Bainbridge Island, WA
NASA/Ames, Moffett Field, CA

Robert F. Behler, 29; Capt. USAF
Rome, NY; (HS) Norman, OK
6512 Test Sq., Edwards AFB, CA

Donald C. Bulloch, 32; Major USAF
Alexandria, LA; (HS) Belle Chasse, LA
AirCommand & Staff College, Maxwell AFB, AL

William J. Fields, 35; Major USAF
Baltimore, MD; (HS) Baltimore, MD
Armament Development Test Center, Eglin AFB, FL

William F. Harrison, 32; Lt.Cdr. USN
Charleston, SC; (HS) Hicksville, NY
NAS Whidbey Island, Oak Harbor, WA

Jane L. Holley, 30; Capt. USAF
Shreveport, LA; (HS) Annandale, VA
USAF Tactical Fighter Weapons Center, Nellis AFB, NV

Robert A. Lancaster, Jr., 30; Capt. USAF
Washington, DC; (HS) Fairmont Heights, MD
Aeronautical Systems Division, Wright Patterson AFB, OH

Johnnie B. Ligon, 35, Capt. USAF
Henderson, KY; (HS) Evansville, IN
3246th Test Wing, Eglin AFB, FL

John M. Lounge, 31; Lt. USN
Denver, CO; (HS) Burlington, CO
Naval Electronics Systems Command, Washington, DC

Richard M. Mullane, 32; Capt. USAF
Wichita Falls, TX; (HS) Albuquerque, NM
3246th Test Wing, Eglin AFB, FL

George C. Nield IV, 27; Capt. USAF
Washington, DC; (HS) Annandale, VA
USAF Flight Test Center, Edwards AFB, CA

- more -

RELEASE NO:
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Frederick K. Olafson, 30; Capt. USAF
Seattle, WA; (HS) Westport, WA
3246th Test Wing, Eglin AFB, FL

Ellison S. Onizuka, 31; Capt. USAF
Kealahkekua, HI; (HS) Kealahkekua, HI
USAF Test Pilot School, Edwards AFB, CA

Michael T. Probasco, 26; 1st Lt. USAF
Houston, TX; (HS) Topeka, KS
SA-ALC/MMSRE, Kelly AFB, TX

Jerry L. Ross, 29; Capt. USAF
Gary, IN; (HS) Crown Point, IN
USAF Flight Test Center, Edwards AFB, CA

Vernon P. Saxon, Jr., 32; Capt. USAF
Birmingham, AL; (HS) Bellevue, NE
USAF Test Pilot School, Edwards AFB, CA

Charles W. Schillinger, 34; Capt. USMC
Chicago, IL; (HS) Holland, MI
NAS Whidbey Island, Oak Harbor, WA

Robert L. Stewart, 35; Major USA
Washington, DC; (HS) Hattiesburg, MS
US Army Aviation Engineering Flight Activity, Edwards AFB, CA

Erik M. Stolle, 29; civilian
Pensacola, FL; (HS) Chatsworth, CA
USAF Test & Evaluation Center, Kirtland AFB, NM

Charles A. Vehlow, 31; Capt. USA
Waukesha, WI; (HS) Waukesha, WI
Naval War College of Command & Staff, Newport, RI

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton E. Reim

RELEASE NO: 77-70

For Release:

Friday, November 4, 1977
Noon

NINTH GROUP OF ASTRONAUT APPLICANTS FOR SHUTTLE AT JSC NOV. 7-11

The ninth group of Space Shuttle astronaut applicants is scheduled to be at the NASA Johnson Space Center, November 7-11 for a week of physical examinations and individual interviews.

This group includes 21 mission specialist applicants and two pilot applicants. Eleven of the applicants are military with representatives from each of the four services. Two of the applicants are women bringing the total number of women applicants to 20.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 or more for further screening. With this group, 183 applicants have been selected to come to JSC for further screening. Of the above, 79 are pilots and 104 are mission specialist applicants.

As many as 20 astronaut candidates will be selected in each category -- pilot and mission specialist. Those selected will be notified in December and will report to JSC at a later date for a two-year training and evaluation period. The candidates will become astronauts after satisfactory completion of the two-year period.

The names, age, degrees and/or military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this ninth group are:

-more-

RELEASE NO: 77-70
page 2

Lt. Franklin S. Achille, 29, USN
Doylestown, PA; (HS) Los Altos, CA
Naval Air Test Center, Patuxent River, MD

Lt. David W. Anderson, 29, USN
Lincoln, IL; (HS) Princeton, IN
Naval Air Test Center, Patuxent River, MD

Maj. Guion S. Bluford, Jr., 34, USAF
Philadelphia, PA; (HS) Philadelphia, PA
Wright Patterson AFB, Dayton, OH

Lt. Joseph C. Boudreaux III, 30, USN
New Orleans, LA; (HS) Severna Park, MD
Cruiser Destroyer Group 5, FPO San Francisco, CA

David R. Dougherty, 32, Ph.D
Enid, OK; (HS) Enid, OK
Louisiana State University, Baton Rouge, LA

Capt. Thomas E. Edwards, 35, Ph.D, US Army
Starkville, MS; (HS) Starkville, MS
US Army Air Mobility Research and Development Lab
NASA/Langley Research Center, Hampton, VA

Maj. John M. Fabian, 38, Ph.D, USAF
Goosecreek, TX; (HS) Pullman, WA
USAF Academy, CO

William F. Fisher, 31, MD
Dallas, TX; (HS) N. Syracuse, NY
Los Angeles, CA

CDR Stuart J. Fitrell, 38, USN (Pilot)
Cleveland, OH; (HS) East Cleveland, OH
Commanding Officer, Attack Squadron 66, NAS, Cecil Field, FL

Lt. Dale A. Gardner, 28, USN
Fairmont, MN; (HS) Savanna, IL
NAS, Pt. Mugu, CA

Robert L. Golden, 37, Ph.D
Alameda, CA; (HS) Alameda, CA
NASA/Johnson Space Center, Houston, TX

Terry J. Hart, 31
Pittsburgh, PA; (HS) Pittsburgh, PA
Bell Telephone Laboratories, Whippany, NJ

-more-

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Barbara J. Holden, 32, Ph.D
Los Angeles, CA; (HS) Lincoln, NE
Naval Weapons Center, China Lake, CA

Gary R. Jackman, 32, Ph.D
Waterbury, CT; (HS) Cheshire, CT
University of Florida, Gainesville, FL

Lawrence W. Lay, 33, DO
Kansas City, MO; (HS) Kansas City, MO
Flint Osteopathic Hospital, Flint, MI

Samuel E. Logan, 30, MD
Los Angeles, CA; (HS) Woodland Hills, CA
UCLA Medical School, Los Angeles, CA

Gregory B. McKenna, 28, Ph.D
Pittsburgh, PA; (HS) Pittsburgh, PA
National Bureau of Standards, Washington, D.C.

Judith A. Resnik, 28, Ph.D
Akron, OH; (HS) Akron, OH
Xerox Corporation, El Segundo, CA

Capt. Eugene A. Smith, 32, USAF
Utica, NY; (HS) Middleville, NY
Office of the Secretary of the Air Force
Los Angeles Air Force Station, CA

Maj. Robert C. Springer, 35, USMC (Pilot)
St. Louis, MO; (HS) Ashland, OH
Naval Air Test Center, Patuxent River, MD

Norman E. Thagard, 34, MD
Marianna, FL; (HS) Jacksonville, FL
Medical University of South Carolina, Charleston, SC

James D. vanHofen, 33, Ph.D
Fresno, CA; (HS) Millbrae, CA
University of Houston, Houston, TX

Capt. Robert C. Ward, 35, USAF, MD
Homestead, FL; (HS) Miami, FL
Hill AFB, UT

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Terry White

RELEASE NO: 77-71

For Release

November 4, 1977
2 p.m. CST

JSC PICKS ILC INDUSTRIES FOR SHUTTLE CREW EQUIPMENT

The NASA Johnson Space Center has selected ILC Industries, Inc. of Frederica, Maryland, for negotiations leading to a contract for development, production and support of Space Shuttle crew equipment and stowage provisions.

Estimated value of the cost-plus-fixed-fee contract will be \$1.2 million. The contract will begin January 2, 1978 and end September 30, 1980.

Covered under the contract will be crew clothing "shipsets," Orbiter survival kit, crew lifevest, personal hygiene kits, ancillary crew provisions, and Orbiter stowage provisions. The contract will also cover replacement, servicing and maintenance, and special studies involving the crew equipment.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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During

Terry White

For Release

RELEASE NO: 77-72

November 4, 1977

STONESIFER HEADS NEW JSC EXPERIMENTS OFFICE

John C. Stonesifer has been named to head the newly created JSC Life Sciences Experiments Program Office. JSC is the lead NASA field center for program management, planning, development and operation of life sciences experiments to be carried aboard Space Shuttle and other future spaceflight programs.

Life sciences flight experiment activities at JSC, at Ames Research Center and at Kennedy Space Center will be managed by the new program office.

Stonesifer will continue as acting chief of the JSC Bioengineering Systems Division until a replacement is named.

Stonesifer joined NASA in 1957 at the Langley Research Center and transferred to the NASA Space Task Group in 1962 during Project Mercury. He was chief of the JSC Recovery Branch before becoming chief of the Bioengineering Systems Division. He holds a BS degree from the University of Miami.

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NASA-JSC

NASA News

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Lyndon B. Johnson Space Center
Houston, Texas 77058
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see out

Charles Redmond

RELEASE NO: 77-73

ALSO RELEASED AT NASA HEADQUARTERS

For Release:
Upon Receipt
Nov. 7, 1977

NASA'S LANDSAT TO MONITOR COMMERCIAL TIMBER RESOURCES

NASA and the St. Regis Paper Co., New York City, have agreed to use NASA's Landsat satellite to demonstrate the technical and economic effectiveness of monitoring commercial timber resources scattered throughout a five-state area from 900 kilometers (560 miles) altitude. The Landsat data will be computer processed into a forest resource information system to be used in the management of the St. Regis timberland reserves.

NASA's Johnson Space Center, Houston, Texas, will provide technical expertise in the development of an automatic classification system covering forested areas.

The objectives of the cooperative venture are: to identify kinds of trees, estimate timber volume and productivity, implement techniques to detect changes in the health and growth of the forests and integrate the new technology with existing operational data bases (aerial photography and survey information).

- more -

Remotely sensed forest resource information (Landsat data) will be provided by Johnson Center through the Laboratory for Applications of Remote Sensing (LARS), Purdue University, Lafayette, Indiana. LARS will be operating under a separate contract from Johnson Center.

The St. Regis project manager will direct day-to-day operations of the experiment, expected to last through 1980. The NASA project manager will coordinate the LARS-Purdue and Johnson Center technical efforts.

The land area to be surveyed as part of the experiment consists of forestland owned by the St. Regis Co. in Florida, Georgia, Alabama, Mississippi and Louisiana.

All software and techniques developed through this experiment will be considered in the public domain and can therefore benefit other forest resource managers besides St. Regis.

This experiment is the first major demonstration of its kind between a private company and NASA. Cooperative ventures exploring applications of Landsat and other remote sensors in the past have been with NASA and other U.S. or foreign government departments.

Landsat, circling the globe 14 times a day 900 km (560 miles) overhead, surveys Earth natural resources with an electronic multi-spectral scanner that returns data for visual images and computer tapes from which experts can distinguish different types of terrain, vegetation, soils, rock outcrops and other surface features.

- more -

Besides mapping forests and possible mineral areas, the data has been used for -- among other things -- measuring crop acreages, mapping snow cover, detecting oil slicks, mapping urban and agricultural land use, detecting offshore dumping of sewage and industrial waste, monitoring the environmental effects of strip mining and locating potential earthquake zones.

Landsat-1 has been in operation since July 1972 and a sister spacecraft, Landsat-2, since January 1975. A third one is planned for launch by NASA next year.

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November 7, 1977

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 77-74

November 7, 1977

ALSO RELEASED AT NASA HEADQUARTERS
AND DRYDEN FLIGHT RESEARCH CENTER

SHUTTLE ORBITER FERRY TEST FLIGHTS PLANNED

Four ferry test flights of the Space Shuttle Orbiter Enterprise, mated to the Boeing 747 Shuttle Carrier Aircraft (SCA), have been scheduled for November 14, 15, 17 and 18 at NASA's Dryden Flight Research Center.

The flights will be made to measure the performance of the mated combination with a three degree forward angle between them. Previous flights were flown with a six degree angle.

Data gathered will be used for planning the first ferry flight, now scheduled for March 1978, when Orbiter Vehicle 101 (the Enterprise) will be transported atop the 747 to the NASA Marshall Space Flight Center in Huntsville, Alabama, for ground vibration tests.

Subsequent ferry flights will transport future Orbiters to NASA's Kennedy Space Center in Florida where they will be launched

- more -

into space following their construction at the Rockwell International facility, Palmdale, California. After the first four orbital flights, which will be recovered at Dryden, the Orbiter used in those tests will also be returned to Kennedy atop the SCA.

In subsequent flights, the Orbiters will return and land at the Florida center.

In addition to determining what the best speed and altitudes are for ferry flight configuration, other test conditions to be explored include holding-pattern performance and engine-out performance, both in cruise and the landing/takeoff pattern. The first flight will primarily examine buffet and flutter on the SCA's horizontal tail.

Maximum speed for the series of four ferry flight tests should be approximately 450 mph, peak altitude will be 26,000 feet, and top take-off weight will be 710,000 lbs.

Crew for 747 will be Fitzhugh Fulton, SCA commander, and Tom McMurtry, SCA pilot. Flight engineers will be Victor Horton and Skip Guidry. The four were members of the prime crew who flew the 747 in the approach and landing test flights, completed on October 26, 1977.

The NASA Johnson Space Center, Houston, is responsible for the design, development and testing of the Space Shuttle Orbiter.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
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Milton E. Reim

For Release

RELEASE NO: 77-75

November 11, 1977
Noon

TENTH GROUP OF ASTRONAUT APPLICANTS REPORT TO JSC NOVEMBER 14

The tenth group of Space Shuttle astronaut applicants is scheduled to report to the NASA Johnson Space Center on November 14, for a week of physical examinations and individual interviews.

This group includes 24 mission specialist applicants and one pilot applicant. Eight of the applicants in this group are military and one is a woman.

There were 8,079 applicants for the Space Shuttle astronaut program. From these, 208 have been selected to be brought to JSC in groups of 20 or more for further screening.

Including this group of 25 applicants, 80 pilot and 128 mission specialist applicants (21 were women) will have been at JSC for further screening prior to the final selection.

Notification of selection of as many as 20 astronaut candidates in each of the categories---pilot and mission specialist---will be made in December. The candidates will report at a later date to JSC for a two-year evaluation and training period before their final selection as astronauts.

The name, age, degrees and/or military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this tenth group are:

- more -

Atwood, William B., 30, Ph.D.
Nashua, NH; (HS) Williamstown, MA
CERN, EP Division, Geneva, Switzerland

Belcher, Robert C., 28
Del Rio, TX; (HS) Brackettville, TX
University of Texas (graduate student), Austin, TX

Bird, Ronald S., 35, LCDR, USN, Ph.D.
Ann Arbor, MI; (HS) Clearwater, FL
Pacific Missile Test Center, Pt. Mugu, CA

Buchli, James F., 32, Capt., USMC
New Rockford, ND; (HS) Fargo, ND
Naval Air Test Center, Patuxent River, MD

Cox, John T., 33, Ph.D.
New York, NY; (HS) Sherman Oaks, CA
NASA/JSC, Houston, TX

Cruce, Andrew C., 34, Ph.D.
Fresno, CA; (HS) Tulsa, OK
Naval Air Test Center, Patuxent River, MD

Diner, David J., 24, Ph.D.
New York, NY; (HS) Bronx, NY
Caltech, Pasadena, CA

Ephrath, Ayre R., 35, Ph.D.
Czechoslovakia; (HS) Tel Aviv, Israel
University of Connecticut, Storrs, CT

Galik, Richard S., 26, Ph.D.
Hackensack, NJ; (HS) Lyndhurst, NJ
Rittenhouse Labs, University of Pennsylvania, Philadelphia, PA

Gregory, Frederick D., 36, Maj., USAF (Pilot)
Washington, D.C.; (HS) Washington, D.C.
Armed Forces Staff College, Norfolk, VA

Hagar, Hamilton, Jr., 37, Ph.D.
New York City, NY; (HS) Sarasota, FL
Jet Propulsion Laboratory, Pasadena, CA

Jones, John F., Jr., 31, Ph.D.
Detroit, MI; (HS) Berkley, MI
Sandia Laboratories, Livermore, CA

- more -

Lichtenberg, Byron K., 29
Stroudsburg, PA; (HS) Stroudsburg, PA
MIT, Cambridge, MA

Maine, Richard E., 26
Louisville, KY; (HS) Charlottesville, VA
NASA/Dryden Flight Research Center, Edwards AFB. CA

McNair, Ronald E., 27, Ph.D.
Lake City, SC; (HS) Lake City, SC
Hughes Research Laboratories, Malibu, CA

Ortega, Joseph K. E., 31, Ph.D.
Trinidad, CO; (HS) Denver, CO
University of Colorado, Boulder, CO

Rhoads, Harold S., 31, Capt., USAF, Ph.D.
Lexington, KY; (HS) Lexington, KY
4950th Test Wing, Kirtland AFB, NM

Richards, David W., 34, M.D., Ph.D.
San Pedro, CA; (HS) Demarest, NJ
North Broward Emergency Physician, Ft. Lauderdale, FL

Schlein, Paul B., 33, LCDR, USN, Ph.D.
Stockton, CA; (HS) Manteca, CA
NAVELEX, Washington, D.C.

Sessoms, Alan L., 30, Ph.D.
New York, NY; (HS) New York, NY
Harvard University, Cambridge, MA

Strada, Joseph A., 32, LCDR, USN, Ph.D.
Philadelphia, PA; (HS) Cherry Hill, NJ
SAMSO, Los Angeles Air Force Station, CA

Sullivan, Kathryn D., 26
Paterson, NJ; (HS) Woodland Hills, CA
Dalhousie University (graduate student), Halifax, Nova Scotia

Vieira, David J., 27, Ph.D.
Oakland, CA; (HS) Castro Valley, CA
Lawrence Berkeley Lab, University of California, Berkeley, CA

Walton, James R., 30, Capt., USAF, Ph.D.
Ithaca, NY; (HS) Pittsburgh, PA
366th Tactical Fighter Wing, Mountain Home AFB, ID

Weir, Charles R., 29, Lt., USCG
Sidney, NE; (HS) Gurley, NE
Oceanographic Unit, U.S. Coast Guard, Washington, D.C.

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NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release

RELEASE NO: 77-76

November 15, 1977
2:00 p.m. CST



NASA SIGNS ADD-ON TO ORBITER CONTRACT

The NASA Johnson Space Center, Houston, has signed a supplemental agreement with Rockwell International Corporation's Space Division of Downey, California, covering engineering change orders on the Space Shuttle Orbiter.

The supplement is valued at approximately \$226 million, bringing the total Rockwell contract value to approximately \$3.2 billion.

Covered in the supplement are changes such as addition of the Orbiter lightning protection system, payload and systems integration activities, avionics changes, spares provisioning, support of the Shuttle carrier aircraft during Approach and Landing Test, and many miscellaneous changes.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

Release No: 77-77

For Release:

November 15, 1977
2:00 p.m. CST

NASA SIGNS ADD-ON TO FORD CONTRACT

The NASA Johnson Space Center, Houston, has signed a contract modification with Ford Aerospace and Communications Corporation covering hardware and software systems engineering, and maintenance and operations of the Mission Control Center and other ground-based data systems at JSC.

Valued at \$1,412,716, the modification brings the total value of the cost-plus-award-fee Ford contract to \$51,279,165.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Nov 11-25

Milton Reim

RELEASE NO: 77-78

ALSO RELEASED AT NASA HEADQUARTERS

For Release

Upon Receipt

Nov. 11, 1977

UNITED STATES, SOVIET SPACE TALKS SCHEDULED

NASA and the Soviet Union's Academy of Sciences will hold discussions November 14-17 in Moscow concerning further cooperation in space. The talks are a result of an agreement reached by NASA and the Soviet Academy of Sciences May 11, 1977, following a meeting of representatives of the two agencies in Washington.

The U.S. delegation is headed by Dr. Noel Hinners, Associate Administrator for Space Science, NASA Headquarters. The Soviet delegation is expected to be led by Dr. Boris Petrov, Chairman of the Interkosmos Council of the Soviet Academy of Sciences.

The Moscow meetings are exploratory and their purpose is to identify candidate areas for studies to define a possible joint experimental program in the 1980's using spacecraft of the U.S. Space Shuttle type and the Soviet Salyut type.

- more -

The delegation will meet as two working groups; one on science and applications, chaired by Dr. Hinnars, and one on operations, chaired by Dr. Glynn Lunney, manager of the Shuttle Payload Integration and Development Program Office at NASA's Johnson Space Center, Houston, Texas.

The two working groups will seek to define scientific areas for possible experimentation which might benefit from the flexible delivery capability and large capacity of the Space Shuttle and the capability for longer stay time in orbit represented by the Salyut.

In another area, the eighth annual meeting of the NASA-Soviet Space Biology and Medicine Working Group will be held November 19-25 at NASA's Wallops Flight Center, Wallops Island, Virginia. Prior to the formal meeting, a workshop on simulated weightlessness will be held November 16-18 in Bethesda, Maryland. The workshop and meeting are part of a continuing program under the 1971 Science and Applications Agreement between NASA and the Soviet Academy of Sciences.


The meeting will focus on biomedical results, including the preliminary results of the Cosmos 936 flight on which U.S. experiments were flown; a briefing from the Soviets on Salyut 5/Soyuz 19 mission; and a U.S. briefing on the Spacelab Missions Demonstration Test. Participants will also discuss forecasting man's health state in weightlessness and the research approach to studying space motion sickness.

The U.S. delegation of the formal meeting will be headed by Dr. David Winter, NASA Director for Life Sciences. Dr. Rufus Hessberg, Director of Space Medicine, will head the U.S. workshop participants. The Soviet leader at both meetings will be Dr. Nikolai Gurovsky of the U.S.S.R. Ministry of Health.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111



Charles Redmond

For Release

RELEASE NO: 77- 86

December 15, 1977

MISSION CONTROL CENTER TO BENEFIT FROM SOLAR POWER

The Mission Control Center at the Lyndon B. Johnson Space Center was recently modified to enable the dehumidification equipment servicing the building to operate partially through solar power.

Normally the moisture in the computer facility is extracted from the building air system by passing air over cooling coils where the moisture condenses out. The air then passes through a heat exchanger where it is heated to the proper temperature using hot water from the space center's central steam plant.

Solar panels installed on the roof of the control center will be used to supplement the steam system. The solar panels are part of a closed system which circulates water through the panels, a heat-exchanger, pumps, expansion tanks, and back through the solar panels.

-more-

Weather service calculations for the Houston area indicate the solar system should be able to provide complete or supplemental heating for 60 percent of the time. The heat the panels provide will save about 1.5 million cubic feet of natural gas a year. This is the equivalent gas use of about 16 4-bedroom homes.

The mission control solar system construction cost is about \$240,000. The solar system was constructed as part of a joint NASA/Department of Energy solar energy demonstration project. Several other NASA centers are also participating in the project.

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December 15, 1977

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release:

RELEASE NO: 78-06

February 3, 1978

ALSO RELEASED AT NASA HEADQUARTERS

DATA ON THE ORBIT OF THE SKYLAB WORKSHOP

The latest data on the orbit of the Skylab Workshop indicates that it will have descended to 150 nautical miles (173 statute miles, 278 kilometers) altitude and could begin reentry into the Earth's atmosphere as early as late summer of 1979 and as late as the second quarter of 1980.

NASA bases its prediction on data provided by the North American Air Defense Command's (NORAD) satellite tracking organization, the Smithsonian Astrophysical Observatory, and the Swiss Federal Observatory.

NASA is working on plans that may extend the Skylab reentry time, such as reactivation of the Skylab Workshop's thruster attitude control system (TACS) to cause it to go into a very slow tumble which would decrease the atmospheric drag and perhaps add several months to the orbital lifetime. NASA will attempt this in spring of 1978.

In addition, the launch of a Teleoperator Retrieval System (TRS) on an early Space Shuttle mission, about October 1979 is being

(more)

examined. The TRS would be carried into orbit by the Shuttle, removed from the Shuttle payload bay and flown by remote control to dock with Skylab. Once docked, a propulsion system on TRS could be operated either to raise the Skylab orbit or to cause it to reenter the atmosphere in a controlled fashion to a remote ocean area of the Earth below. (TRS is part of NASA's Fiscal 1979 Budget proposal now before the Congress.)

Skylab is the largest payload in Earth orbit. It weighs 85 tons and is about 96 feet long. The main portion is cylindrical, 22 feet in diameter.

Skylab on descending into the Earth's atmosphere is expected to break up and burn during descent. Some debris is expected to survive the reentry and reach the Earth's surface. It is probable that any surviving debris would land in an ocean since 80 per cent of the Earth beneath the Skylab orbit is water. In orbit, Skylab is passing above the area of Earth between 50 degrees north and 50 degrees south latitude.

Skylab was launched in May 1973 and was manned during three missions by three different astronaut crews. The last crew departed Skylab February 8, 1974 at an altitude of 237 nautical miles (273 sm, 440 km). Skylab presently is 220 nautical miles (253 sm, 408 km) above Earth.

At the time the final crew departed NASA estimated that the orbiting workshop would remain in space until 1983. However, since

(more)

that time the orbit has decreased at a higher-than-anticipated rate and NASA has been adjusting its predictions from time to time. Contributing to the more rapid rate-of-descent is an increase in atmospheric drag which in turn is caused by sunspot activity.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 78-08

February 10, 1978

JOHNSON SPACE CENTER TO PROCESS PRISTINE METEORITE FRAGMENTS

The Johnson Space Center, Houston, has begun a new program for receiving and processing rare and pristine meteorite samples. Until quite recently a special program for meteorites has not been needed because the meteorite fragments found had been contaminated by reactions with the soil where they fell, by the effects of weather, and by the often unsterile handling conditions once they had been recovered.

The new meteorite facility will handle a new, near-pristine, meteorite collection found this winter near McMurdo Station, in the Antarctic.

The first meteorite samples arrived at the space center on Saturday, February 11, and were two 200-300 gram (baseball-sized) fragments believed by the National Science Foundation to be rare carbonaceous chondrites. These two samples could contain evidence of primordial matter from our solar system.

- more -

The samples were found on the Antarctic ice shelf by Dr. William Cassidy, a University of Pittsburgh geologist working under a grant from the NSF. Cassidy hypothesized that very large finds of meteorites might be discovered in areas of the Antarctic where ancient, "blue ice," was raised to the surface. Cassidy suggested meteorites which fell on Antarctica in centuries past could appear on the surface along with the ice.

The exact manner by which the ice and meteorites move to the surface from beneath hundreds of feet of snowpack is not well understood; however, Cassidy found 310 meteorite fragments in a two-month period this past December and January. Cassidy feels the fragments represent between 20 and 50 different meteorites. This is the most concentrated find ever collected. There are at present fragments from an estimated 2,000 meteorites which have been found. Because of the exceptional preserving conditions in the extreme cold and dry environment of Antarctica, the 310 samples which Cassidy found are considered the most uncontaminated, near-pristine meteorite samples ever collected.

To insure that the samples would be collected properly, the NSF and NASA's Lunar Curatorial Facility in Houston, equipped Cassidy with special sterile equipment used to handle the lunar sample collection.

The meteorite processing facility at the space center will receive the samples, and, using glove-boxes first used to handle material from the moon, will document the samples and make initial characterization studies of the fragments, which will be weighed and photographed.

Following the initial documentation, the samples might also be freeze-dried to remove any water-ice trapped in the sample. A mold might also be taken of the fragments. The samples will then be stored in dry nitrogen gas in special cabinets.

A special committee comprised of members of the NSF, the Smithsonian Museum of Natural History, NASA, and Dr. Cassidy's team is expected to produce a detailed plan for a more systematic examination of the samples.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release:

RELEASE NO: 78-11

February 23, 1978

"Enterprise" at Ellington

Enterprise, the nation's first Space Shuttle orbiter, will be on display at Ellington Air Force Base for three days, March 10-12, 1978.

Enterprise is enroute to the NASA Marshall Space Flight Center, Huntsville, Alabama, where it will undergo a series of ground vibration tests. The 75-ton orbiter will be flown piggy-back atop its carrier aircraft, a modified 747 jetliner. The Ellington Air Force Base stop is a scheduled re-fueling stop for the 747 enroute from the NASA Dryden Flight Research Center, Edwards, California to the NASA facility in Alabama.

The public is invited to view the landing at 2 p.m., March 10. The 747 Orbiter combination will be on public display from 2 p.m. through 5 p.m. on March 10 and again from 9 a.m. to 5 p.m. on March 11 and March 12.

Enterprise is the first of several Shuttle orbiters NASA plans to build for the Shuttle Transportation System which will begin with

- more -

initial test flights now scheduled for the spring of 1979. Enterprise was used in the successful approach and landing test project during which time it was released from the 747 carrier aircraft for a piloted landing at Edwards Air Force Base. These tests were completed in October.

The Shuttle orbiter will be used at least 100 times during the Shuttle program. It will be boosted into low earth orbit by means of its three main engines, coupled with the two solid rocket boosters which are strapped to the side of the external fuel tank. The boosters, like the Orbiter, will be reused.

When the vibration tests are concluded at the Marshall Space Flight Center, Enterprise will be returned to California where it is scheduled for major modifications. The first space flights of Shuttle will be with a second orbiter now being assembled at the Rockwell International Space Division plant at Palmdale, California.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release:

RELEASE NO: 78-12

February 23, 1978

SLAYTON APPOINTMENT

Astronaut Donald K. Slayton has been appointed manager of the Orbital Flight Test program for Space Shuttle at the NASA Johnson Space Center.

Slayton, one of the original seven Mercury astronauts and a member of the U.S. crew of the Apollo Soyuz Test Project in the summer of 1975 will be responsible for all mission-unique activities associated with the six orbital flight tests of the Space Shuttle. He reports directly to Robert F. Thompson, Space Shuttle Program Manager at JSC.

In his new position Slayton will represent the Program Manager across the total program to insure timely and appropriate resolution of all OFT mission unique issues. OFT flights are scheduled to begin in the spring of 1979.

- more -

Slayton was selected in April 1959 as one of the original seven Mercury astronauts. He later served as Director of Flight Crew Operations for several years and in July 1975 flew as the docking module pilot for the joint Apollo Soyuz Test project with the Soviet Union. Most recently he managed the highly successful Approach and Landing Test Project in which the Shuttle orbiter was released from atop a 747 carrier aircraft to piloted landings at the Edwards Air Force Base, Edwards, California.

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Milton E. Reim

For Release:
Immediate

RELEASE NO: 78-13

SKYLAB ACTIVATION

NASA will attempt to contact the orbiting Skylab space station beginning Monday from a ground station in Bermuda.

NASA engineers will attempt to turn on the Skylab command and telemetry systems and place some of the onboard storage batteries in a circuit so that they will receive "trickle" charge from the Skylab's solar cell panels.

Objective of the exercise is to determine what condition the Skylab and its subsystems are in.

The attempt will be conducted by NASA engineers and flight controllers from the Marshall Space Flight Center, Huntsville, Ala., and Johnson Space Center, Houston, Texas in addition to the NASA/Goddard Space Flight Center tracking crews.

NASA plans subsequent contacts after mid-April from the Mission Control Center in Houston, through the Bermuda and Madrid ground stations. These contacts would be designed to activate the Skylab

-more-

attitude reference and control system in order to determine the space station's attitude and possibly modifying it.

One of the possibilities is change the orientation of Skylab in a manner which will reduce atmospheric drag and possibly add some months to its orbital lifetime.

Current NASA predictions indicate that the Skylab will enter the atmosphere sometime between early summer 1979 and the second quarter of 1980. NASA is hopeful it will be able to rendezvous with Skylab on a Space Shuttle test flight in October 1979, to remotely maneuver a propulsion stage to dock with Skylab and use this stage to either propel Skylab to a higher orbit for future use or to cause it to reenter the atmosphere in a controlled manner to insure that debris would land in a remote area of an ocean.

The first attempt to communicate with Skylab will be when it is over Bermuda and in the sunlight.

Flight controllers plan to turn on the Skylab Airlock Module-Orbital Workshop telemetry link, evaluate it and turn it off on the first pass.

On a subsequent pass they will repeat the above procedure and also turn on the Apollo Telescope Mount telemetry link and evaluate it, then turn it off.

-more-

When the controllers have determined that the communications systems are in order, the next step will be to activate batteries in the Airlock Module and Orbital Workshop and put them on trickle charge from electrical power supplied by the solar panels. The status of the battery charging will be evaluated on later passes of Skylab over Bermuda.

Three flight controllers from Houston will be at the Bermuda site. Bill Peters, the team leader, will be assisted by Harry Black, instrumentation and communications officer (INCO), and Steve McLendon, electrical, general instrumentation and life support officer (EGIL). The reactivation procedure is expected to be completed in one to two weeks.

Skylab was launched May 14, 1973 from Florida and was visited by three astronaut crews during 1973-74. The final crew departed February 8, 1974.

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March 1, 1978

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton Reim
RELEASE NO: 78-15

For Release:
Immediate
March 16, 1978

NASA NAMES ASTRONAUT CREWS FOR EARLY SHUTTLE FLIGHTS

Four two-man crews have been selected to begin training for early orbital flights of the Space Shuttle. They are:

John W. Young, 47, commander; Robert L. Crippen, 40, pilot

Joe H. Engle, 45, commander; Richard H. Truly, 40, pilot

Fred W. Haise, 45, commander; Jack R. Lousma, 42, pilot

Vance D. Brand, 46, commander; Charles G. Fullerton, 41, pilot

Young and Crippen will be the prime flight crew for the first orbital flight test (OFT-1) scheduled for launch from NASA's Kennedy Space Center in the spring of 1979.

Engle and Truly will be their backup crew.

Flight assignments for the others named today will be made at a later date.

NASA plans a series of six orbital flight tests, each of increasing complexity, to check out the nation's first reusable spacecraft. On the first four flights, the 75-ton orbiter will

return from space to an unpowered landing on a dry lakebed at Edwards Air Force Base, California. Thereafter, the spacecraft will return to a specially constructed runway at its Cape Canaveral launch site.

The space agency is currently considering a mission to boost Skylab into a higher orbit during one of the OFT flights. If the decision is made to implement that plan, prime and backup flight crews will be selected from those named today.

Young is Chief of the Astronaut Office and a veteran of four space flights. He was pilot of the first manned Gemini flight, Gemini 3, in 1965; command pilot of Gemini 10 in 1966; command module pilot of Apollo 10 in 1969; and commander of Apollo 16, a lunar landing mission in 1972. He has been a member of four backup crews. Young, a retired Navy captain, has been an astronaut since 1962.

Crippen will be making his first space flight. A Navy commander, he has been a NASA astronaut since 1969 when he was transferred from the cancelled USAF Manned Orbiting Laboratory program. Crippen was a crew member on the Skylab Medical Experiments Altitude Tests (SMEAT), a 56-day simulation of a Skylab mission. He was a member of astronaut support crews for Skylab and Apollo Soyuz Test Project missions.

- more -

Engle, an Air Force colonel, commanded one of the two crews which flew the Space Shuttle approach and landing tests in 1977. Prior to his selection as a NASA astronaut in 1966, he was a test pilot in the X-15 research program and had qualified for astronaut wings in X-15 rocket plane flights exceeding 50 miles altitude. Engle was backup lunar module pilot for the Apollo 14 mission.

Truly flew with Engle in the Shuttle approach and landing tests. He is a Navy commander and was a MOL astronaut prior to transferring to NASA in 1969. Truly was on astronaut support crews for Skylab and Apollo Soyuz missions.

Haise, a civilian, was lunar module pilot for Apollo 13 in 1970 and commanded one of the two flight crews for the Shuttle approach and landing tests last year. He was backup lunar module pilot for the Apollo 8 and 11 missions and backup spacecraft commander for Apollo 16. He became an astronaut in 1956 after several years as a NASA research pilot.

Lousma, a Marine Corps lieutenant colonel, was pilot for Skylab 3 in 1973. He was backup docking module pilot for the Apollo Soyuz mission and served on astronaut support crews for the Apollo 9, 10, and 13 missions. Lousma has been an astronaut since 1966.

Brand was command module pilot for the Apollo Soyuz mission in 1975. An astronaut since 1966, he was a support crewman for

Apollo 8 and 13, backup command module pilot for Apollo 15 and backup commander for the Skylab 3 and 4 missions. Brand is a civilian.

Fullerton flew Shuttle approach and landing tests with Haise. An Air Force lieutenant colonel, he was assigned to the MOL program before becoming a NASA astronaut in 1969. Fullerton served on astronaut support crews for the Apollo 14 and 17 missions.

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National Aeronautics and
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Milt Reim

For Release:

RELEASE NO: 78-16

March 17, 1978

SHUTTLE FLIGHT DIRECTORS NAMED BY NASA

Flight directors for the first manned Shuttle orbital flight have been named by the National Aeronautics and Space Administration at the Johnson Space Center in Houston.

The new flight directors are Neil B. Hutchinson, Charles B. Lewis, and Donald R. Puddy, all of the JSC Flight Operations Directorate. They will be responsible for planning and directing the activities of the Mission Control Center during Shuttle real-time mission operations.

Their responsibilities will include the integration of inputs from all elements of NASA, contractor and the scientific communities.

Hutchinson will be responsible for planning and directing all activities associated with the Shuttle ascent phase, Lewis the on-orbit phase and Puddy the entry phase of the Orbiter.

Hutchinson, Lewis and Puddy were flight directors during Apollo and Skylab missions.

The first flight of the Shuttle is scheduled for early in 1979 and will be launched from the Kennedy Space Center in Florida with control of the flight conducted from Houston.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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Terry White

For Release:

RELEASE NO: 78-19

May 17, 1978

SPACE BIOSCIENCE CONFERENCE HELD BY UT, NASA-JSC

Ways to exploit the advantages of space flight in biomedical research will be explored in a two-day conference sponsored by the University of Texas Health Science Center in Houston and by the NASA Johnson Space Center.

The first session of "Space: A Challenge for the Life Sciences," will begin at noon May 23 in the Cabaret Room of the Shamrock Hilton Hotel, and the May 24 morning session will be at Johnson Space Center's Gilruth Recreation Facility.

Speakers for the May 23 session are UT Health Science Center President Truman G. Blocker, MD; JSC Director Christopher C. Kraft, Jr.; NASA Director for Life Sciences David L. Winter, MD; JSC Director of Space and Life Sciences Richard S. Johnston, and University of California Oncology Professor Steven Armentrout, MD.

The Tuesday session ends with a panel discussion on space flight applications.

A continental breakfast starts the Wednesday session at JSC's Gilruth Center, followed by mini-seminars in specific disciplines of space biosciences.

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NASA-JSC

NASA News

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Terry White

For Release:

RELEASE NO: 78-20

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

NASA PLANS SKYLAB ATTITUDE CHANGE PROCEDURES

As a result of successful contact with Skylab during interrogations from tracking stations in March and April, NASA will attempt to uplink from Mission Control at Johnson Space Center a series of attitude change procedures with Skylab beginning early next month.

The activities, beginning June 1, involve putting a new computer program into the onboard computer, using the attitude control system to maneuver Skylab into the desired position and operating the control moment gyros to keep the spacecraft in that mode. These procedures should be completed by mid-June.

- more -

These procedures are designed to establish control of the spacecraft and thereby extend its orbital lifetime by perhaps as much as 6 to 12 months. If these attitude change maneuvers are successful and the gyros continue to operate, Skylab's reentry into the Earth's atmosphere could be delayed until sometime between late 1979 and mid-1980. The maneuvers will decrease atmospheric drag on the spacecraft by orienting it to be aligned with the flight path.

If the desired attitude is achieved, Skylab then will be monitored on a daily basis. Hopefully, no additional maneuvers or adjustments will be necessary. A successful attitude change maneuver could provide sufficient time to carry out a Skylab reboost or controlled deorbit mission on an early Space Shuttle flight.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 78-22

May 30, 1978
2 p.m. CDT

JSC NEGOTIATES WITH A-V CORPORATION FOR AUDIOVISUAL PUBLIC INFORMATION SUPPORT SERVICES

The National Aeronautics and Space Administration has selected A-V Service Corporation to enter into formal negotiations for award of a contract for Audiovisual Public Information Support Services.

The work to be performed will fall into two main areas: (1) General audiovisual support; and (2) motion-picture production. The contractor shall perform audiovisual support services that include the following: (1) Operate and maintain a public information still photographic library; (2) maintain a motion-picture distribution library; (3) provide news and information media services; (4) provide design and documentation support to the JSC Public Affairs Office; (5) provide projection services; (6) maintain an audiovisual equipment loan pool; and (7) produce motion pictures.

- more -

A-V Service Corporation's proposed contract amount is approximately \$600,000 for the initial one year period beginning July 1, 1978. It is contemplated that additional periods of time, not to exceed 24 months in 12-month increments, will be negotiated.

The other proposers were McGregor & Werner, Incorporated, Washington, D.C. and National Film Company, Inc., Houston, Texas.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release

RELEASE NO: 78-23

May 31, 1978

FOURTH ANNUAL AEROSPACE WORKSHOP SET FOR JUNE 5

The fourth annual aerospace workshop for educators will be held at the Johnson Space Center June 5 through 16, 1978. Sponsored jointly by JSC, the University of Houston and the Civil Air Patrol, the workshop will include non-technical aviation and space lectures and demonstrations and field trips aimed at elementary, secondary and college-level administrators, counselors and teachers.

Topics include aerospace education, hot air balloons -- including a launch, NASA aircraft operations, the Civil Air Patrol, tracking and communications, physiological training for astronauts, the Space Shuttle, space crew systems, Earth resources, astronaut selection, the lunar sample program, the Landsat program, solar power satellites, and NASA future programs.

- more -

The fee for the workshop is \$60 and includes materials, books and field-trip transportation. Three semester hours undergraduate or graduate credit will be offered by the University of Houston to persons attending the workshop.

Workshop applications should be made to Robert M. Jones, University of Houston, Office of Curriculum and Instruction, Houston, Texas 77058, ac 713 488-9290; or Dr. Jacob Blankenship, University of Houston, Office of Curriculum and Instruction, Houston, Texas 77004, ac 713 749-3578.

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NASA News

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AC 713 483-5111

Charles Redmond

For Release:
Upon Receipt

Release no: 78-24

SPACE CENTER TO BEGIN PROCESSING OF RARE METEORITES

Two meteorite samples retrieved under clean conditions near Allan Hills in the TransAntarctic Mountains and believed to be rare carbon-bearing types will undergo initial examination at the Johnson Space Center on Thursday, June 8, 1978. The two special meteorites were collected along with over 300 other, less rare types, on an expedition sponsored by the National Science Foundation and led by Dr. William Cassidy, a University of Pittsburgh geologist, this past December and January.

If, as expected, the two carbon-bearing types are verified as carbonaceous chondrites, there is the possibility the two fragments may contain clues of the very earliest epoch of our solar system and may shed some light on the evolution of organic compounds. This knowledge will help in understanding the evolution of life here on Earth.

-more-

Meteorites - 2

Because of the environmental conditions in the Antarctic, such as extremely low humidity and preserving cold air, the meteorites which Cassidy's team found are thought to represent the cleanest and least contaminated meteorites yet collected.

Cassidy had proposed the expedition to the NSF based on studies he made and previous discoveries by the Japanese in the Yamato Mountains that meteorites might be found in certain sections of the TransAntarctic Range where the ice shelf pushed against barrier mountains. Meteorites which had fallen on the ice shelf in millenia past would be at some depth in the ice shelf. As the shelf moved slowly towards the sea any obstruction in its path, such as a mountain or a sub-ice ridge, would obstruct the flow and force an upwelling of clear ice. Strong winds, prevalent on the ice shelf, would blow surface snow cover away and leave meteorites exposed.

Cassidy's group found over 300 such meteorite fragments in a six-mile area during the two month search to test the hypothesis. The 300 or so fragments represent perhaps 30 different meteorite falls.

Because of early expectations of the find, the NSF and the National Aeronautics and Space Administration, provided Cassidy's team with special lunar-type handling equipment and lunar-rock storage boxes so any meteorite fragments which were found could be

Meteorites - 3

kept uncontaminated until a facility and procedures were established for their examination under clean-room conditions.

The special meteorite facility has been installed in the Lunar and Planetary Sciences laboratory at the Johnson Space Center and procedures for the initial examination and subsequent distribution of the samples have now been approved by a committee comprised of representatives of Cassidy's team, the National Science Foundation, NASA, the Smithsonian Institution, and various universities.

The processing, to begin on June 8, will consist of initial characterization of the samples. This will involve the precise weighing and photographic documentation of the samples along with a written description of each sample. The samples were found in a frozen condition, were kept frozen during their transport from the Antarctic to Houston, and will be kept frozen during the initial processing. Subsequent studies will be performed by investigators at various laboratories throughout the country.

Cassidy and a team of meteorite searchers are expected to return to the Antarctic again this coming summer season there to continue their meteorite search.

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NASA News

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AC 713 483-5111

24/14

Charles Redmond

For Release:

RELEASE NO: 78-25

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

NOTE TO EDITORS:

This is a summary of recent activities to extend the orbital life of Skylab.

NASA has successfully placed America's 77,111-kilogram (85-ton), 36-meter (118-foot) long space station, Skylab, in an orbital position which hopefully will give it a "new lease on life."

A team of engineers and controllers from the Johnson Space Center, Houston, Texas; Marshall Space Flight Center, Huntsville, Alabama; IBM and three tracking stations -- Bermuda; Madrid, Spain; and Goldstone, California -- have completed a four-month plan of scheduled events to stabilize and trim the orbital position of Skylab.

- more -

Maneuvers which began Friday, June 8, and ended Sunday, June 11, placed the space station in an attitude which reduces the atmospheric drag on the vehicle at its orbital height of 389 kilometers (242 statute miles).

Assuming continued functioning of the gyros, this new attitude is hoped to extend by six to 12 months the orbital lifetime of Skylab -- to late 1979 or early 1980. This should give NASA additional time to possibly implement a plan it is considering with an early Space Shuttle test flight to carry out a Skylab reboost into higher orbit or controlled deorbit for maximum safety into a remote ocean area.

The weekend maneuvers climaxed activities that began last March when engineers and flight controllers at the Bermuda tracking station began checking out various Skylab systems which would be used and bringing Skylab's batteries to a fully-charged state.

On Thursday, June 8, flight controllers turned on the dormant control moment gyros (CMG's) which make up a portion of the Skylab attitude control system used to maneuver the space station into a position and hold it. The other part of the system is the thruster attitude control system (TACS) which expels nitrogen gas through nozzles to move Skylab into various attitudes as it orbits Earth.

- more -

Both systems are controlled by a computer which has various sensors to indicate position.

Two of the gyros were activated and worked as expected. A third gyro failed during the last Skylab manned mission in 1974 and is not being used.

On June 9, Skylab was commanded into a solar inertial attitude (in which the spacecraft solar cells always face the Sun) using the TACS and stayed in that position under CMG control. However, a spurious signal from an onboard switch selector during subsequent commanding caused Skylab to move from this position. The vehicle automatically switched control to the TACS. On the next orbit, the vehicle was returned to solar inertial and placed under CMG control. For this reason, engineers decided to delay the final maneuver to the low-drag attitude for a day so that Marshall engineers could perform simulations to understand the problem and hopefully prevent it from recurring.

Early Sunday, June 11, Skylab was maneuvered into its desired "end-on-velocity-vector" attitude in which the docking port is forward and its long axis is parallel to the ground and along the flight path.

- more -

It remains in this position with its TACS inhibited and engineers are continuing to monitor Skylab and to periodically transmit minor corrections to the onboard computer which is maintaining the position.

Skylab was launched May 15, 1973, and was manned during three missions by three different astronaut crews. The last crew departed Skylab February 8, 1974, at an altitude of 445 km (276 statute miles). Skylab presently is 389 km (242 statute miles) above Earth.

At the time the final crew departed, NASA estimated that the orbiting workshop would remain in space until 1983 permitting ample opportunities to reach it on Space Shuttle missions. However, since that time the orbit has decreased at a higher-than-anticipated rate. Contributing to the more rapid rate of descent is an increase in atmospheric drag caused by heavier sunspot activity than had originally been predicted.

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June 19, 1978

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

June 23, 1978

RELEASE NO: 78-26

METEORITE FRAGMENT CONFIRMED AS RARE TYPE

A meteorite found last winter in the frozen reaches of the Antarctic has been confirmed by both the National Aeronautics and Space Administration and the Smithsonian Institution to be one of the rarest types of meteorites ever found. The meteorite fragment, which has not yet been named, was found by Dr. William Cassidy, of the University of Pittsburgh, while on an expedition sponsored by the National Science Foundation specifically to search for meteorites.

This rare meteorite, called a carbonaceous chondrite because of its high carbon content, was found with what is believed to be another similar sample and about 300 other specimens.

The meteorite fragment was examined by a team of meteorite experts at the Johnson Space Center on Thursday, June 8. The team consisted of Dr. Everett Gibson, Johnson Space Center geochemist, Dr. Carleton Moore, director of the Center for Meteorite Studies at

- more -

Arizona State University, and Dr. Elbert King, University of Houston Geology Department. The examination took place with the meteorite inside a lunar-type glove box flushed with dry nitrogen gas. A binocular microscope was used for the initial examination.

Dr. Brian Mason of the Smithsonian Institution and one of the leading experts on meteorites was sent a .4 gram (point four gram) sample from the meteorite fragment and provided further petrographic analysis using thin sections from the sample.

The carbonaceous chondrite which was examined is a 19.91 gram (nineteen point nine-one gram) sample which has an overall charcoal grey color with a slight olive green cast. The interior consists of a fine-grained grey matrix with about two to three percent light inclusions called chondrules.

The meteorite fragment is a Type II carbonaceous chondrite, not the rarest sample which are Type I's, but the next rarest type. Fifteen other Type II samples have been found, though none in so clean a condition and so well preserved. The Type II carbonaceous chondrites have previously been shown to contain amino acids of a non-terrestrial origin. This suggests the chemical formation of complex organic molecules can occur in other regions of our solar system. Carbonaceous chondrites, like other meteorites, are 4.5 to 4.6 billion years old. This age is believed to be

the age of other bodies in our solar system.

Fragments from this meteorite sample are expected to expand our knowledge of the chemical and physical evolution processes of the early solar system and to enhance our knowledge of the regularity of this evolution in other planetary systems.

The space center in Houston is providing special handling and curatorial service for the meteorite collection since the fragments were found in what has been called the "cleanest conditions under which meteorites have been recovered."

The special precautions being taken in the examination and curation of the meteorites arises out of the belief that the fragments have not been significantly contaminated since their arrival on Earth. The samples have been preserved under excellent conditions in the Antarctic where the constant cold and extremely dry air are considered to have preserved the samples in a near-pristine state.

Subsequent analysis is expected to begin in the future after the meteorite fragments have been characterized, sectioned into smaller pieces, and fully documented. The new meteorite processing laboratory at the space center has begun to process and classify the remainder of the collection. Samples will be sent as soon

meteorites - 4

as possible after characterization to investigators for further, detailed examination.

A special newsletter covering the processing and documentation of the samples is being prepared by space center lunar and planetary science curatorial staff and will be distributed periodically to researchers in the field.

It is also expected that the Cassidy team will pursue their meteorite search again this winter in the Antarctic.

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14, June 1978

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 78-29

June 30, 1978
2 p.m. CDT

ALSO RELEASED AT NASA HEADQUARTERS

COMPUTER SCIENCES GETS JSC COMPUTER SYSTEMS CONTRACT

The National Aeronautics and Space Administration has selected Computer Sciences Corp. of Falls Church, Virginia, for negotiations leading to the award of a cost-plus-award-fee contract for performance of institutional computer systems engineering, development and production operations work at Johnson Space Center, Houston, for a five-year period. The contractor's estimated cost for the first three years is approximately \$40 million.

Computer Sciences Corp. will perform systems engineering and definition, applied software development and computer systems and related facility planning and development for the Central Computing Facility (CCF) and computer operations for the CCF and Mission Control Center. The computer operations function includes equipment operations, job scheduling and processing, dispatch services, job quality control, maintenance of tape libraries, production coordination and other related tasks.

- more -

The contract will be under the management and technical direction of the Johnson Space Center and will be for that portion of the work currently being performed by Lockheed Electronics Co., Inc., of Houston, at Johnson, which provides data systems development, programming, operations support and engineering of those facilities under the management responsibility of the Institutional Data Systems Division and for facility operations support of the Data Computation Complex (formerly the Real-Time Computer Complex) under the management responsibility of the Ground Data Systems Division.

Proposals were also submitted by: Lockheed Electronics Co., Inc., Systems and Services Division, Houston; KENTRON International, Inc., Dallas; and ITT/Federal Electric Corp., Paramus, New Jersey.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton Reim

For Release:

RELEASE NO: 78-32

July 24, 1978

ASTRONAUT CANDIDATES LEARN WATER SURVIVAL TECHNIQUES

Sixteen astronaut candidates from the NASA Johnson Space Center in Houston are scheduled to spend three days in training at the Homestead Air Force Water Survival School in Florida, beginning July 31.

Most of the 35 astronaut candidates had the water survival training prior to entering the NASA program. Included in the 16 that will take the training are the six female astronaut candidates.

Each day's activities during the course will include classroom lectures on water survival techniques plus actual training in the water environment. Briefings on procedures will precede each activity.

The training includes jumping from a tower wearing a tethered parachute harness while sliding down a wire to a landing in the water. The candidates will also be towed through the water in a

- more -

parachute harness, simulating a parachute dragging one across the surface and having to release one's self.

Other exercises will require the astronaut candidates to be towed aloft under a parasail canopy, land in the water, and be picked up by a boat. On the final plunge into the water via parasail, the astronaut candidates will be coming down with full survival gear. A helicopter will pick them up from their life raft.

The USAF Water Survival School is operated by the 3613th Combat Crew training squadron with headquarters at Fairchild AFB, Washington.

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Lyndon B. Johnson Space Center
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MAIL
Room

Milton Reim

For Release

RELEASE NO: 78-33

July 26, 1978

JOE ALLEN RETURNS TO JOHNSON SPACE CENTER ASTRONAUT OFFICE

Dr. Joseph P. Allen, scientist-astronaut has returned to active flight status in the Astronaut Office at the NASA Johnson Space Center.

From August 1, 1975 until his return to JSC, Allen has served as Director, Office of Legislative Affairs at NASA Headquarters in Washington, D.C. He will continue the duties of that post in addition to his astronaut duties until a replacement is named.

Allen returns to JSC as a senior scientist-astronaut and will be eligible for selection as a Space Shuttle crewman.

Allen was selected as a scientist-astronaut by NASA in August 1967. He completed the initial academic training and a 53-week course in flight training at Vance AFB, Oklahoma.

He served as mission scientist while a member of the astronaut support crew for Apollo 15 and served as staff consultant on science and technology to the President's Council on International Economic Policy.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

LH/14

Milton Reim

RELEASE NO: 78-34

For Release:

August 1, 1978
2 p.m. CDT

MISSION SPECIALISTS FOR SPACELAB 1 NAMED AT JSC

Astronauts Dr. Owen K. Garriott and Dr. Robert A. Parker have been selected by NASA to serve as Mission Specialists on the Spacelab 1 mission which is scheduled for the early 1980's.

This first flight of Spacelab is planned as a seven-day flight and is primarily for the verification testing of the Spacelab systems and Spacelab and Orbiter interfaces. In addition, approximately 40 experiments will be on board.

Garriott flew on the second manned Skylab mission of 59 days duration. Experiment operations on that flight were very successful and involved a multiplicity of experiments in several disciplines.

Parker served as Mission Scientist and Spacecraft Communicator during Apollo and Skylab. On Skylab he made many of the decisions that insured the successful accomplishment of experiments during the flight. For the past four years Parker has been actively involved in reviewing all aspects of the development of Spacelab for the Astronaut Office.

- more -

Mission Specialists have the overall responsibility for the coordination, with the Commander and Pilot, of Space Shuttle operations in the areas of crew activity planning, consumables usage, and Shuttle Transportation System/payload interaction.

Spacelab, developed and financed by 10 European nations under agreements concluded with the European Space Agency, will be carried in the cargo bay of the Shuttle Orbiter.

The lab will supply investigators with a fully furnished laboratory adapted for the weightless environment of space and pressurized for working without spacesuits.

In addition to the Commander, Pilot and two Mission Specialists, Spacelab 1 will include two Payload Specialists, one European and one U.S. citizen who have primary responsibility for operating the science instruments.

With six crewmen onboard it will be possible to have two operational shifts of three crewmen each, consisting of a Mission Specialist, Commander/Pilot, and Payload Specialist.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

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Charles Redmond

For Release:

Release No: 78-35

August 9, 1978

NASA, USGS PUBLISH FAULT MAP OF SOUTHEAST GREATER HOUSTON AREA

The United States Geological Survey and the National Aeronautics and Space Administration, Johnson Space Center, announce the publication, by the USGS, of a surface fault map of southeastern Harris and portions of Galveston and Brazoria Counties.

The fault map, covering about 200 square miles of developed and undeveloped land is the result of work by JSC geologist Uel Clanton and Earl Verbeek of the USGS. It was undertaken jointly by NASA and the USGS to evaluate the magnitude of the faulting problem in the metropolitan Houston area.

The map covers that portion of Harris, Galveston, and Brazoria Counties bounded by Clear Lake in the south, Loop-610 and Texas-225 in the north, about two miles west of Texas-35 in the west, and Texas-146 in the east.

Ninety-one faults with a total length of 110 miles are shown on the map.

Urban portions of the Houston metropolitan area encompassed by the map include part or all of the cities of Pasadena, LaPorte, South Houston, Taylor Lake Village, El Lago, Seabrook, Webster, Brookside, Pearland, Friendswood, Nassau Bay, and the southeast section of Houston.

Faults cut through residential and commercial areas in many of the cities listed above. Faulting is extensive east and southwest of Hobby Airport. Non-developed portions of the southeastern quadrant of Harris County which are crossed by faults are in the areas of the Clear Lake, Friendswood-Webster, South Houston and Mykawa oil fields. The Mykawa oil field in particular has extensive faulting in both a northwesterly and northeasterly direction.

The map was produced using a combination of aerial photography and ground-level confirmation of the faults. The map should be used as a general guide to the prevalence of faulting near any particular locality and it should not be used in the absence of site-specific studies. The map should be considered to be a minimum statement on faulting, and should be supplemented by more detailed local studies wherever faulting may pose a significant hazard to anticipated land use, especially along extensions of mapped faults or in an area of extensive faulting.

The high side of a fault is called the upthrown side. The physical feature at the break is called a scarp. The low side is called the downthrow side. Typical scarps in the southeastern Harris County area have heights of between one and two feet. Fewer than five percent of the scarps are higher than three feet.

Faults in the urban areas of the map's coverage are probably underrepresented since only active and damaging faults are readily detected. Inactive or slowly moving faults, and all faults in newly developed areas where damage is not yet severe may escape notice unless the scarp is of substantial height or has not been destroyed by landfill or excavation during the development.

Examination of the map shows that nearly all of the faults are confined to two well-defined, curvilinear belts which bear a close relationship to oil fields in the area. The association is not accidental. All major fields shown on the map are known or thought to be producing from sediments above or peripheral to salt domes. It is believed that the formation of the domes and the faulting are genetically related.

The faults are natural geologic features of antiquity. Seismic and drilling data reveals that the faults persist to depths of thousands of feet and show clear indications of prehistoric movement extending over millions of years.

There is ample evidence for a prehistoric origin of the faults, and for prehistoric motion along them. Unresolved is the question of why many faults are so active today. It can be documented that natural movement on some faults persisted into the very recent geologic past, and is likely continuing. However, contemporary rates of movement along many faults, which range up to one-inch per year, are in excess of what has occurred in the past.

If the contemporary rates were characteristic of the recent past, there should be many fault scarps over 30 feet. The largest fault on the map has a scarp height of little more than three feet. The present anomalous rate of movement may be the result of human activity, specifically petroleum and ground water production.

The extraction of large quantities of water from shallow sediments beneath the city, and production of petroleum from somewhat deeper levels, has resulted in large declines in fluid pressures within the subsurface sediments. Inasmuch as a link between fluid-pressure declines and land-surface subsidence is well established, it may be that the withdrawal of water and petroleum products is somehow triggering or accelerating motion along preexisting faults as well.

NASA-JSC

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LH-14

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

Release No: 78-36

August 9, 1978

SYMPOSIUM TO DISCUSS RESULTS OF MAJOR CROP MONITORING EXPERIMENT

For three years the U.S. government, working with university and industrial research groups, has been involved in a major experiment to determine if wheat production in major growing areas throughout the world could be estimated using data from satellites and the global weather observing network.

The Department of Agriculture, the National Oceanic and Atmospheric Administration have been cooperative partners in the Large Area Crop Inventory Experiment, known as LACIE.

This October 23-26, results from the three-year-long experiment will be discussed at the first major symposium on crop monitoring based on space-age technology. The symposium will be held at the Johnson Space Center, Houston, Texas. The topics range from the general, such as the state of existing global crop forecasting, to the specific, such as how to estimate sampling size for the statistical analysis used by the computers. This symposium will be a complete reporting on the conduct and results of the experiment.

The LACIE experiment was begun in the fall of 1974. At that time the USDA felt the need for an improved source for global crop information. In the United States, the USDA has already established a reliable and timely crop reporting system but for many important wheat-growing areas, throughout the world, information is very limited.

The LACIE experiment involved the research, development and testing of an

emerging technology known as remote sensing, combined with conventional weather data, to monitor and inventory agricultural commodities on a global scale.

Wheat because of its great importance in trade and human nutrition, was the primary commodity investigated for this experiment. Electronic imagery from space was gathered by the Landsat orbiting satellites which continually scan the agricultural regions of Earth and provide data for area estimates. Daily data from 8,000 worldwide weather stations were used both to make timely predictions of crop area, yield and production in domestic and foreign wheat growing regions and to provide an early warning of problems.

The effort on the LACIE experiment took skills in many technical fields. Earth resources scientists were involved in identifying the "signature" or appearance of wheat in the satellite data. Other scientists were involved in the development of techniques to estimate the growth stage of wheat. Computer programs were written to examine weather conditions along with the crop yields achieved in past growing seasons in order to estimate the yield for the current growing season, and to combine area and yield estimates for wheat production reports.

The experiment centered on the hard red wheat crop in the U.S. Great Plains, where detailed data is available, for comparison and testing of the technology. Comparisons were made with USDA reports and ground truth gathered by county agents over many sites.

The LACIE activity is now nearing completion, and the results show that this new technology can be used effectively in improving the knowledge of global wheat production. The technology is believed to be generally applicable to other crops and the USDA is currently considering the use of this new technology as a data source to aid them in their responsibility to provide early warnings of significant changes in the global commodity production outlook.

The four-day symposium, to be held at NASA's Johnson Space Center, Houston, Texas will conclude the experiment. People from government, industrial agricultural and university communities around the world will be attending to learn more about this pioneering effort, and to discuss how this new technological tool can best be utilized to improve the world food situation.

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NASA-JSC

NASA News

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Houston, Texas 77058
AC 713 483-5111

LH-14

Milton Reim

For Release:

Release No: 78-37

August 15, 1978

FORMER NASA ASTRONAUTS TO ATTEND BRIEFINGS AT JOHNSON SPACE CENTER

Astronauts formerly with the NASA space program have been invited to the Johnson Space Center by Dr. Christopher C. Kraft, Jr., center director, for a series of briefings on present and future programs.

Invitations were extended to 31 of the former astronauts to take part in technical briefings and to bring them up to date on the status of the NASA programs. The briefings will take place August 21 and 22 at the space center.

The agenda includes a NASA overview by administrator Dr. Robert A. Frosch and a review of the Space Transportation System by John F. Yardley, associate administrator for STS, Washington, D.C.

Robert F. Thompson, manager, Space Shuttle Program at JSC will brief the former astronauts on that program, and Aaron Cohen, manager of the Orbiter Project will brief them on the Shuttle Orbiter.

A Space Transportation System Operations briefing will be given by Glynn S. Lunney, manager, Shuttle Payload Integration and Development Program.

Lt. Gen. Thomas P. Stafford, deputy chief of staff for Research, Development and Acquisition will brief the group on the U.S. Air Force Shuttle Program.

A review on the Approach and Landing Program, the Orbital Flight Test status of Shuttle and the current activities with Skylab will be presented to the assembled group of former astronauts by Donald K. Slayton, manager for Orbital Flight Test.

John Young, chief, Astronaut Office, will bring the group up to date on crew selection and training, and a briefing on Flight Control Operations will be presented by M. P. "Pete" Frank, chief, Flight Control Division.

A briefing on global food and fibre inventory will be given by W. E. Rice, manager, Earth Resources Program, and Robert O. Piland, associate director for Program Development, Engineering and Development, will brief the former astronauts on the solar power satellite.

The flight crews of the Orbiter Approach and Landing Tests will brief the group on their flights, and Jerry C. Bostick, manager, Payload Deployment and Retrieval Systems Office will brief the group on US/USSR Joint Space Program Status.

A briefing on what we have learned from the Moon rocks will be given by John R. Sevier, associate director of the Lunar Planetary Institute.

While here at JSC, inspection tours will be conducted for the former astronauts of the Crew Systems area, remote manipulator system, full-scale orbiter mockup, and the Orbiter Aeroflight Simulator/Shuttle Mission Simulator.

The former astronauts will also be offered the opportunity to have one-on-one sessions with other astronauts and management heads at JSC during the two day session.

Several of the former astronauts will take their annual physical while here at JSC during the two day session .

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The 31 former astronauts invited for the two day briefing sessions are:
Edwin E. Aldrin, Jr., William A. Anders, Neil A. Armstrong, Frank Borman,
M. Scott Carpenter, Gerald P. Carr, Eugene A. Cernan, Michael Collins, Charles
Conrad, Jr., L. Gordon Cooper, Walter Cunningham, Charles M. Duke, Jr., Donn
F. Eisele, Anthony W. England, Ronald E. Evans, John H. Glenn, Richard F.
Gordon, Jr., James B. Irwin, James A. Lovell, Jr., James A. McDivitt, Edgar
D. Mitchell, William R. Pogue, Stuart A. Roosa, Walter M. Schirra, Jr.,
Harrison H. Schmitt, Russell L. Schweickart, David R. Scott, Alan B. Shepard,
Jr., Thomas P. Stafford, John L. Swigert, Jr., and Alfred M. Worden.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 78-38

August 18, 1978

JSC TO ASK THINK TANK TO STUDY FUTURE CENTER ROLE

Will controlling 40 to 60 Space Shuttle flights per year limit the Johnson Space Center's ability to perform its basic role of research and development? How can costs be kept low to encourage maximum use of the versatile space transportation system? How will this increased activity affect relationships with other NASA centers and contractors?

A management consulting firm will be asked to help answer those and other questions after a nine-month, \$500,000 study. Joseph P. Loftus, Chief of JSC's Technical Planning Office, said a request for proposals (RFP) on the study will be issued today.

- more -

"Another area to be reported on is the management philosophy here and the relationship between civil service responsibilities and those which are or could be contracted," he said.

Space Shuttle launches are expected to reach the approximate one per week rate by 1985. JSC officials want to be certain that flight operations of that magnitude do not drain off already limited personnel and other resources needed for the Center's principal role as a major research and development arm of the space agency.

Planners here have already drafted a baseline operations plan which covers the mature Shuttle era. The onboard capabilities of the vehicle are greater than in previous spacecraft, so the plan reduces the number of flight controllers assigned to real-time operations on the ground and increases the effort spent on flight planning.

Because the flight control work here affects NASA-wide operations, and because JSC is a key element in future space flight research and development, Center management wants an outside examination of the plan and alternatives prior to committing to it.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:
September 7, 1978

RELEASE NO: 78-40

SHUTTLE MANEUVER ENGINE TESTED AT WHITE SANDS

A test version of the rocket engine that will be used to maneuver the Space Shuttle Orbiter was test fired September 6, at the NASA White Sands Test Facility near Las Cruces, New Mexico.

The 10-second duration burn was the first test firing of the 6000-pound thrust engine in combination with the propellant tanks, feedlines and other components in the Orbital Maneuvering Subsystem (OMS) pod. Shuttle Orbiter has OMS pods on each side of the aft fuselage and adjacent to the three 470,000-pound thrust main engines that boost the spacecraft into orbit.

The OMS engines burn nitrogen tetroxide and monomethyl hydrazine as oxidizer and fuel, and are designed to be reusable for up to 100 space missions with 1000 starts for a total 15 hours firing lifetime. Among the orbital duties of the OMS engines are thrust for final orbital insertion at the end of launch phase, orbit circularization, orbit transfer and changing, rendezvous maneuvers and deorbit burns.

Wednesday's test firing was a checkout of the OMS pod and test stand compatibility and of the test data system.

The first series of 24 engine firings up to 60-seconds duration was completed the following day.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 78-42

September 19, 1978
2 p.m. CDT

ITEK TO BUILD ORBITER CAMERA SYSTEM

The NASA Johnson Space Center, Houston, has signed a contract with Itek Optical Systems Division of Lexington, Massachusetts, for the Space Shuttle Orbiter Camera Payload System. The cost-plus-incentive-fee contract is valued at \$4,890,000 and covers the first flight system and an option for a second system.

Planned for space flight in Orbiter's 15 by 65-foot cargo bay on pallets and test racks built by NASA or by the European Space Agency (ESA), the Orbiter Camera Payload System is a flexible photographic array for Earth imaging surveys, remote sensing experiments and as an adjunct to non-imaging systems.

The second option covers a large format camera for the U.S. Geological Survey, and if exercised, will increase the contract value by \$1.5 million.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release:

RELEASE NO: 78-43

September 22, 1978
2 p.m. CDT

JSC SELECTS GENERAL ELECTRIC COMPANY FOR SHUTTLE FOOD GALLEY

The NASA Johnson Space Center has selected General Electric Company, Space Division, Valley Forge, Pennsylvania, for negotiations leading to a contract for the Space Shuttle Orbiter Food System Galley for the Space Shuttle Program. The contract will be under the management and technical direction of the Johnson Space Center, Houston, Texas.

The contractor's estimated cost and fixed fee for the program is approximately \$1.2 million. The contract will begin December 1978, and end January 1981. The contract effort will be performed in Valley Forge, Pennsylvania.

The galley contract will be for a food preparation facility providing food preparation equipment (hot and cold water dispensers, oven, hot water heater) and serving equipment (meal trays).

Other firms proposing were Fairchild Republic Company, Farmingdale, L.I., New York, and the Nelson and Johnson Engineering, Inc., Boulder, Colorado.

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NASA-JSC

LH-14

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 78-46

Upon Receipt

OMB OFFICIAL TO ADDRESS SYMPOSIUM

The chief of the Office of Federal Procurement Policy, Office of Management and Budget, Lester A. Fettig, will be the keynote speaker at the annual South Central Regional symposium of the National Contract Management Association.

The symposium will be held at the Baywood Country Club, Houston, on October 26 and 27. This year's topic is "Contract Management - Now and in the Future," and deals with the most recent ideas on the subject of contract management. William R. Kelly, special assistant for management to the director of the Johnson Space Center, is symposium chairman.

Key subjects which will be discussed during the two-day symposium include contract management for energy programs and the relationship between government and industry.

This year's symposium is being presented by the Space City - Houston Chapter of the National Contract Management Association.

Registration information can be obtained from Gene Matlock, P. O. Box 58513, Houston, Texas 77058.

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October 11, 1978

NASA-JSC

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 78-49

Upon Receipt

SEASAT SCIENTIST TO TALK ABOUT HURRICANE MEASUREMENTS

Dr. Peter G. Black of the NOAA National Hurricane and Experimental Meteorology Laboratory, will speak on "Preliminary Seasat Measurements of Surface Winds in Hurricane Conditions," on Wednesday, November 15, at the Lunar and Planetary Institute, 3303 NASA Road One.

The lecture will be held in the Berkner Room of the LPI at 4 p.m.

The public is invited to attend the lecture. Additional information can be obtained from Dr. A. J. Irving (LPI) ac 713 488-5200 ext. 53 or Ms. Fran Waranius (LPI) ac 713 488-5200 ext. 35.

Seasat is a NASA satellite launched this past June. The Seasat mission is to determine if a spacecraft carrying microwave instruments can provide useful information about the sea surface and atmosphere, and how they interact. The payload on the satellite includes four microwave sensors and a visual and infrared radiometer. Experiment teams, drawn

- more -

from scientists representing various oceanographic disciplines will determine the geophysical significance of the microwave data. Dr. Black is a member of the team studying data from the radar scatterometer.

The Seasat failed October 10, due to system power dysfunction. Jet Propulsion Laboratory technicians have so far been unsuccessful in attempts to revive it.

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October 30, 1978

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release:

RELEASE NO: 78-50

October 31, 1978

ALSO RELEASED AT NASA HEADQUARTERS

SKYLAB ORBITAL ATTITUDE TO BE REVERSED

The Skylab space station will be rotated 180 degrees in its orbit on Friday, November 3. The vehicle is presently flying with its docking-module forward, in the direction of flight, with the vehicle's long axis parallel to the surface of the Earth. This attitude -- called End-On Velocity Vector (EOVV) -- offers the least drag in the extremely thin atmosphere at Skylab's orbital altitude of 375 kilometers (234 statute miles).

The rotation, from what is called forward EOVV to backward EOVV is necessitated by low temperature conditions on one of the Control Moment Gyros (CMG), resulting from periodic long term shading from the Sun. The Sun angle, called beta angle, is a function of the orbit inclination (in Skylab's case, 50 degrees relative to the equator), the position of the Earth around the Sun and certain other seasonal factors.

- more -

When the CMG is shadowed for excessive periods of time, the bearing temperature drops which results in decreased lubrication and increased bearing friction leading to possible CMG failure. The CMG is essential for Skylab to hold a stable attitude.

By turning the Skylab around in its orbit, before mid-November, the CMG will be exposed to more Sun and normal temperatures can be maintained.

The reversed position of the Skylab is not expected to change the orbital life predictions by any significant amount.

The vehicle will be turned around again, back to the forward EOVV, in about six months in order to maintain proper Sun exposure to the CMG.

This maneuver is not expected to use any of the remaining nitrogen thruster fuel which is being reserved for use during docking maneuvers with the teleoperator retrieval system planned for the second Space Shuttle flight.

On Sunday, October 15, the tracking station at Santiago, Chile, was put on line for the Skylab reactivation. There are now five tracking stations supporting the Skylab mission: Goldstone, California; Bermuda Island; Ascension Island; Madrid, Spain; and Santiago. Also on Sunday the flight control operation at Houston Mission Control went to a 24-hour-a-day operation.

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NASA News

LH-14

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release

RELEASE NO: 78-52

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

GLOBAL CROP EXPERIMENT EVALUATED

A three-year Large Area Crop Inventory Experiment (LACIE) using space age technology to monitor global wheat production has been completed.

Results of the experiment were presented at a symposium at the Johnson Space Center, Houston, Texas, attended by more than 700 conferees from 22 nations. They represented federal agencies, private companies, universities and the governments of foreign countries.

The experiment was begun in 1974 to determine if data from the Landsat satellite, orbiting some 805 kilometers (500 miles) above the Earth, could be used with surface weather observations and information derived from U.S. operational environmental satellites to predict production of the world's most important grain crop -- wheat.

- more -

The major foreign study areas were Canada and the Soviet Union, with preliminary examination of wheat-growing areas of Australia, the People's Republic of China, Brazil, India and Argentina. The U.S. Great Plains was used extensively to test and evaluate the several techniques since it was the best source of statistical data with a known reliability.

The LACIE techniques were intended to enhance the accuracy of existing global wheat production forecasts by improving foreign production forecasts and to do so as early in the crop season as possible. The accuracy goal set by the project was to develop a system which would provide estimates accurate within 10 percent of the true production in 9 years out of 10.

In tests over the winter wheat area of the Great Plains it was determined that the accuracy goal could be met. When the techniques were used to monitor the Soviet wheat crop harvested in 1977, the LACIE produced a production estimate of 91.4 million metric tons, less than one percent below the official mark of 92.0 million tons released by the Soviets. However, the capability to achieve such accuracy from year to year has yet to be demonstrated.

The findings were presented to the four-day October symposium by the LACIE participants: NASA, the Department of Agriculture (USDA), the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce and cooperating universities and industry.

- more -

In other study areas such as the spring wheat regions of the U.S. and Canada where long narrow fields are hard to distinguish and where wheat can easily be confused with other spring-planted crops, the accuracy goal was not met. Most importantly, however, LACIE was able to determine the reasons for not meeting its goals in these areas and to identify what would be needed to do so. Future satellites with improved resolution should allow smaller fields to be identified with accuracies similar to that encountered in the Soviet Union where fields are typically quite large.

A peer evaluation team composed of prominent scientists and chaired by Dr. Don Paarlberg, former Director of Economics for USDA, reviewed the LACIE techniques and presented their report at the symposium. In the report, Dr. Paarlberg stated that, "LACIE results to date clearly demonstrate that present remote-sensing capabilities can be combined with or substituted for conventional methods of information collection in order to improve crop production estimates." He concluded the evaluation of the results by saying, "... for global wheat regions such as the U.S.S.R. the LACIE technology can be made operational and that for regions where the technology requires improvement, funding for further research and development should be continued."

NASA, USDA and NOAA which collectively provided the many different skills necessary to make LACIE a success are now defining a follow-on activity to extend the application of space-age technology to agriculture.

- more -

USDA has established an office in Houston near the space center to test the usefulness of LACIE technology in crop condition assessments.

Similar to space exploration done before, the LACIE experiment provided other benefits, notably, in the area of meteorological research.

NOAA scientists used the techniques they developed to relate crop yields to weather and devised mathematical relationships for relating temperature to home heating fuel consumption. These relationships have been used in conjunction with extended forecasts during the past two years for projecting areas of the country where consumption would likely be higher or lower than normal and, thus, allocating the additional amounts of fuel needed in a better manner. This capability which has evolved represents a new national ability to assess the impact of climatic fluctuations and will be extended to other critical national resources.

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Note to science writers and editors:

Copies of the proceedings and peer evaluation report are available from the Office of Public Affairs, Johnson Space Center, Code AP3, Houston, Texas 77058. Illustrative material is also available upon request.

November 17, 1978

NASA News

LA 74

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Charles Redmond

For Release

RELEASE NO: 78-58

December 18, 1978

SUPER GUPPY TO DELIVER SHUTTLE TRAINING EQUIPMENT TO JSC

One of the world's unique freight airplanes, the Super Guppy, will be delivering a high-fidelity Shuttle Orbiter crew compartment mockup to Ellington Air Force Base Wednesday morning. This marks the first time that the Super Guppy has ever been used for the delivery of Space Shuttle equipment.

The crew mockup, a detailed model of the cockpit and living quarters for NASA's Space Shuttle Orbiter, will be installed in one of the training areas at the Johnson Space Center. The mockup will be used for familiarization training for the Shuttle crews. The mockup, a non-working version, weighs 24,000 pounds and was built by Rockwell International, the prime contractor for the Space Shuttle Orbiter.

The Orbiter crew compartment mockup will be loaded on the Super Guppy at Los Alamitos Naval Air Station, near Los Angeles, on Tuesday morning and flown to Ellington with refueling stops scheduled at Davis-Monthan AFB, Tucson, and Dyess AFB, Abilene. The Super Guppy is expected to land at Ellington around 2 a.m. Wednesday.

- more -

Johnson Space Center employees will begin unloading the mockup around 7:30 Wednesday morning. The mockup will be loaded onto a flatbed truck and routed through Clear Lake City to the West Gate at the space center. The mockup will be unloaded at JSC Building 9A around 2 p.m.

The Super Guppy, a modified Boeing YC-97J, is the world's largest aircraft in terms of interior dimension. The fuselage of a 747 aircraft could be placed inside the Super Guppy if sectioned.

The Super Guppy was modified to its present configuration in August of 1965. It was test flown by the late NASA test pilot Joe Walker in late 1965 and first used by NASA in early 1966. The plane was modified and is presently owned by Aero Spacelines, Inc., of Goleta, California.

The plane is equipped with four Pratt & Whitney T34 turboprops and has flown over two million miles carrying cargo for the space agency. It was used extensively during the Apollo and Skylab missions. It last landed at Ellington AFB in June, 1976, on a mission from the Dryden Flight Research Center, California, to the Kennedy Space Center, Florida.

The Super Guppy crew will consist of pilot Paul Heyn, copilot Richard Peters, flight engineer Robert D'Agostini, and crew chief/loadmaster Anthony Scacchi, all Aero Spacelines employees. Accompanying the Aero Spacelines crew on the flight will be Johnson Space Center pilot Frank Marlo.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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Charles Redmond

RELEASE NO: 79-03

For Release

February 1, 1979

SKYLAB FLIGHT CONTROL ACTIVITIES TO BE REDUCED

Flight controllers at the Johnson Space Center will cease round-the-clock monitoring activities for the space station Skylab on Friday, February 2. This decision follows earlier decisions to abandon reboost/deorbit attempts using the Space Shuttle.

Flight controllers will instead monitor the Skylab during one eight-hour shift, five days a week. "The weekly schedule will be arranged so that Skylab monitoring includes one day during the weekend to preclude a two-day absence of coverage," said Charles Harlan, chief of the Payloads Operations Division at the space center.

On Thursday, January 25, flight controllers maneuvered the 78.5 ton space station from a minimum-drag orbital position to one where the space station's solar panels constantly track the Sun. This maneuver was carried out to prepare the Skylab for possible "last chance" maneuver just prior to the craft's reentry. "The Sun-facing attitude will take less flight control effort to maintain," Harlan said.

- more -

Repositioning the Skylab from the minimum drag orbital position will also speed up the decay of the vehicle's orbit. Present estimates now place reentry sometime between June and August of this year.

The space agency has been studying ways to alter the reentry path of the space station, although views differ among agency experts as to the degree of active control which might be effected just prior to reentry.

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AC 713 483-5111

Terry White

RELEASE NO: 79-04

For Release

February 2, 1979

CHINESE VICE PREMIER VISITS SPACE CENTER

Deng Xiaoping, Vice Premier of the People's Republic of China state council, will spend three hours Friday visiting the NASA Johnson Space Center for briefings on the U.S. manned spaceflight program.

JSC Director Christopher C. Kraft, Jr. will greet the vice premier at the JSC Exhibit Hall, where the group will hear descriptions of the current status of the Space Shuttle program as well as view historical space artifacts.

Moving to the JSC crew training facility, the vice premier and his group will be hosted at the Skylab full-size trainer by Alan Bean, lunar module pilot for Apollo 12 and Skylab 3 commander. The vice premier next will make a "flight" aboard the Shuttle Mission Simulator piloted by veteran astronaut Fred Haise, named to fly an early Shuttle orbital test flight.

If time permits, the group will visit a full-scale mockup of the Space Shuttle and remote manipulator.

A luncheon for the visiting group will be held at 12:30 p.m. in the Gilruth Recreation Center. Departure is scheduled for 1:30 p.m.

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NASA-JSC

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Robert Gordon

For Release

RELEASE NO: 79-06

February 1, 1979

ALSO RELEASED AT NASA HEADQUARTERS

see Jan 25,
NASA Release 79-10

SHUTTLE ORBITERS NAMED AFTER SEA VESSELS

The National Aeronautics and Space Administration has named the first four Space Shuttle orbiters to operate in space after sea vessels used in world exploration.

Orbiter 102, scheduled to be launched into Earth orbit late this year, will be named Columbia. Subsequent orbiters will be named Challenger (Orbiter 099), Discovery (Orbiter 103) and Atlantis (Orbiter 104).

The first orbiter constructed (Orbiter 101) was named Enterprise in 1976 after the flagship in the popular television series "Star Trek." Enterprise also was a sailing ship which took part in an important arctic expedition between 1851 and 1854.

Enterprise, which flew the Shuttle approach and landing tests in 1976, now is undergoing vibration tests at NASA's Marshall Space Flight Center, Huntsville, Alabama.

- more -

The Challenger made a prolonged oceanic exploration cruise from December 1872 to May 1876 gathering data about the Atlantic and Pacific Oceans that filled 50 volumes. Challenger also was the name of the Apollo 17 lunar module that landed on the Moon in December 1972.

The sea-going Columbia, out of Boston, entered and explored the mouth of the Columbia River in 1792. Captain Robert Gray named the river after his sloop. Columbia also was the name of one of the first U.S. Navy ships to circumnavigate the globe and the name of the Apollo 11 command module which circled the Moon during the first manned landing on the lunar surface, July 20, 1969.

The Discovery was used to explore Hudson Bay in Canada and to search for a northwest passage from the Atlantic to the Pacific in 1610 and 1611.

The Discovery also was one of two ships in the 1770's used to discover the Hawaiian Islands and explore the coasts of southern Alaska and western Canada.

During the Revolutionary War, Benjamin Franklin issued a safe-conduct request for the English ship Discovery because of interest in the scientific objectives of its expeditions.

The two-masted ketch Atlantis logged half a million miles between 1930 and 1966 as the first American-operated vessel designed especially for ocean research.

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Robert Gordon

For Release

RELEASE NO: 79-07

February 5, 1979

ALSO RELEASED AT NASA HEADQUARTERS

SPACE SHUTTLE ORBITER PROCUREMENT CONTRACT SIGNED

The National Aeronautics and Space Administration has signed a contract with Rockwell International Corp., Space Systems Group, Downey, California, for the manufacture of two Space Shuttle orbiters (OV-103 and 104), conversion of a ground-test orbiter (OV-099), and modification of the first flight orbiter (OV-102).

Completion of the work will provide NASA with four orbiters for Space Shuttle operations.

Under terms of the \$1.9 billion cost-plus-award-fee contract, Rockwell will perform the work at its Downey and Plamdale, California, facilities and at the NASA Kennedy Space Center, Florida. The NASA Johnson Space Center, Houston, Texas, will administer the contract.

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Contained in the contract is the clause "Certification-Wage and Price Standards (1979 Jan)." This clause means that Rockwell will adhere to the wage and price standards promulgated by the Office of Federal Procurement Policy in conformance with the President's anti-inflation policies.

The Space Shuttle is the major element in the nation's new Space Transportation System which becomes fully operational in 1981.

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NASA News

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Charles Redmond

For Release

RELEASE NO: 79-09

February 20, 1979

CONCEPTUAL SPACE CONSTRUCTION EQUIPMENT TESTED

Spacecraft design engineers at the Johnson Space Center last week tested a conceptual "cherry picker" attachment which would be used with the Shuttle Orbiter remote manipulator arm.

This "proof-of-concept" test is the first step in the research and development of a set of space construction devices, which if approved and developed would enable Space Shuttle astronauts to carry out near term (1980's) satellite servicing, maintenance and repair and far term (1990's) large construction projects in earth orbit.

The test involved the use of a prototype Space Shuttle suit which physician-astronaut Joe Kerwin wore while following a series of procedures in the Space Center water immersion facility. The "cherry picker" or manned remote work station, was underwater in the tank.

Kerwin simulated operation of the "cherry picker" in the neutral buoyancy of the water tank.

The water immersion facility simulates some of the difficulties of performing tasks in space.

The conceptual "cherry picker" has controls at the work station so the astronaut can control the motions of the remote manipulator system (RMS). Normally the RMS would be controlled by the mission specialist from inside the Orbiter.

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The envisioned use of this device would be to service on-orbit satellites which are attached to the Orbiter without an astronaut floating freely in space.

The manned remote work station concept was designed after a series of studies by Space Center engineers and outside contractors. The test model was manufactured by the Grumman Aerospace Corporation, Bethpage, N.Y.

Following the test, the concept model is being returned to Bethpage, and Space Center and Grumman engineers will confer about any needed modifications.

These early tests will provide the basis for the manufacture of a development test article which is expected to be delivered to the Space Center early in 1980. The development test article will then be tested on an air-bearing floor with the "cherry picker" attached to the end of an engineering development RMS using either engineer test subjects or astronaut test subjects wearing the Shuttle suit. The results of those tests are expected to be used as the basis for the development of a flight test article which would then be tested in space on one of the Space Shuttle Orbiter flights.

The "cherry picker" concept is envisioned as the "Model T" of a series of space construction work platforms - some of which are completely enclosed and pressurized; some like the "cherry picker" are open and require a suited crewman; some would be miniature space vehicles capable of carrying cargo or personnel from the Orbiter to other points in space.

-more-

All these concepts are presently in the study and preliminary design stage. The space agency has not received funding for the development of any of this equipment. If developed, though, all construction support equipment would be for various types of construction envisioned in both low and high earth orbits (from 100 to 600 nautical miles) and would have to be reusable and compatible with the Orbiter payload bay.

In addition to the studies at the Johnson Space Center, the Marshall Space Flight Center also studies concepts for space construction projects.

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LH-14

MAR. 19

Charles Redmond

For Release

RELEASE NO: 79-10

February 20, 1979

TENTH LUNAR AND PLANETARY SCIENCE CONFERENCE

The tenth annual Lunar and Planetary Science Conference will be held at the Johnson Space Center, Houston, the week of March 19 through March 23, 1979.

The conference opens Monday, March 19, with concurrent science sessions beginning at 8:30 a.m which will continue throughout the week at several sites on the space center.

As with previous conferences, papers to be presented are divided into seven categories:

- 1) Constraints on structure, composition, and history of planetary interiors.
- 2) Characteristics and movements of materials on lunar, planetary and asteroidal surfaces.
- 3) Characterization and evolution of volcanic landforms.
- 4) Characterization and evolution of planetary crusts.
- 5) Nature and effects of impact processes.
- 6) Extraterrestrial materials as solar/interplanetary/interstellar probes.
- 7) Earliest history of the solar system.

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More than 700 scientists from the U.S., Western Europe, Africa, Australia, and the Soviet Union are expected to attend. The first conference was held shortly after the Apollo 11 expeditions returned the first lunar samples and drew 1,700 participants.

During the past several years the conference scope has grown and evolved to include not only reports on the lunar studies, but other related planetary studies and even some astrophysics. This year's conference includes several special sessions which expand, once again, beyond the confines of lunar studies. The 21 sessions include lunar and planetary topics, including the Earth from the viewpoint of planetary science.

On Monday night there is a special session on the "Future Lunar Exploration" will be held beginning at 7:30. The session will include considerations of extended geologic surveys of the moon, lunar rovers, remote sensing satellites, and gravity surveys.

On Tuesday night there is a session on "The Earth from Space, " covering the earth application of satellites. Areas of consideration will be the atmosphere, oceanography, global geology/tectonophysics, plate motions, resources, and climatology.

On Thursday night a special presentation on the Pioneer Venus mission and the Voyager Jupiter encounter will include updates on those missions from the project scientists. The Pioneer Venus mission continues with data

-more-

being sent from the orbiting probe and Voyager. It will have just passed its close encounter with Jupiter. Also on Thursday night a specially prepared three-dimensional film on Mars taken during the extended Viking mission will be shown.

Since this is the tenth anniversary conference, a special presentation on the history and future of lunar and planetary science will take place Wednesday afternoon.

On Friday, session summarizers will present a synopsis of the papers presented during the week.

The conference is co-sponsored by NASA's Johnson Space Center and the University Space Research Association's Lunar and Planetary Institute, which is adjacent to the space center. Conference co-chairmen are Dr. Michael Duke, chief of Lunar and Planetary Science at the space center, and Dr. Thomas McGetchin, director of the Lunar and Planetary Institute.

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Charles Redmond

For Release

RELEASE NO: 79-11

February 20, 1979

SCIENCE SESSIONS OPEN TO THE PUBLIC

It has been nearly ten years since man first set down on another world. We brought back to Earth over 840 pounds of lunar soil and rock. For the past nine years scientists have met annually in Houston to confer on their findings and theories concerning the Moon. For the past three years these scientists have used their lunar knowledge to advance their studies of the other planets in the solar system, including the Earth.

As in the past, this year's Tenth Lunar and Planetary Science Conference will feature a special series of evening programs which will be open to the public. The Conference runs March 19 - 23, 1979.

On Monday Dr. James Arnold (University of California at San Diego) and Dr. David Criswell (Lunar & Planetary Institute) will host a session on "Future Lunar Exploration." The session will cover extended geologic surveys of the Moon, lunar rovers, remote sensing of the Moon, and gravity surveys.

On Tuesday Dr. Leon Silver (California Institute of Technology) and Dr. Edward Flinn (NASA Headquarters) will host a session on "The Earth from Space." The session will explore the applications of planetary investigations

-more-

to the Earth, particularly to our atmosphere, oceans, global geology, plate motions, resources, and climate.

On Thursday Dr. William Quaide (NASA Headquarters) and the project scientists involved with the Pioneer Venus and Voyager missions will present the results from recent Venus probes and the Voyager Jupiter encounter, which will have just occurred. A special 3-D film of Mars made during the extended Viking mission will be shown also.

All of the evening sessions will occur at the Johnson Space Center main Auditorium, Building 2. They will start at 7:30 p.m.

On Wednesday afternoon a special session on the history and future of planetary exploration and science will take place. Details of this program will be announced.

The Johnson Space Center is located southeast of Houston off Interstate 45 (the Gulf Freeway). Visitors should exit at NASA Road 1 and continue east two miles to the center's main gate.

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NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
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Feb 23

Robert Gordon

For Release

RELEASE NO: 79-12

ALSO RELEASED AT NASA HEADQUARTERS

NOTE TO EDITORS

NASA TO MOVE SPACE SHUTTLE ORBITER TO FLORIDA

The Space Shuttle orbiter Columbia (OV-102) will be moved to the Kennedy Space Center (KSC), Florida, in March.

NASA's 747 Shuttle carrier aircraft will depart with Columbia from the Dryden Flight Research Center, Edwards, California, March 9 to arrive at KSC March 10.

The Columbia will be moved overland from Rockwell International's Plant #42, Palmdale, California, to Dryden March 8.

The 747 will make three intermediate stops at military air bases during the cross-country flight.

News media wishing to cover events of the move may contact:

Bob Gordon
Johnson Space Center
Houston
Phone: 713/483-5111

Ralph Jackson
Dryden Flight Research Center
Phone: 805/258-3311

Hugh Harris
Kennedy Space Center
Phone: 305/867-2468

Jim Kukowski
NASA Headquarters
Washington
Phone: 202/755-3090

-more-

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- surely there's more -

Background information pertinent to the ferry flight, overland move and Space Shuttle program will be available at all of the above locations.

News information centers will be established at the Desert Inn, Lancaster, California, March 7 and 8; Dryden Flight Research Center, March 8 and 9; Kennedy Space Center, March 10.

February 23, 1979

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

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Terry White

For Release

NEWS RELEASE NO: 79-13

2 p.m. CST
February 28, 1979

NASA BUYS "SUPER GUPPY" TO HAUL SPACE HARDWARE

The NASA Johnson Space Center has signed a firm-fixed-price contract with Twin Fair, Inc. of Buffalo, New York for the purchase of the "Super Guppy" aircraft.

"Super Guppy" is a modified Boeing KC-97 with an extensively enlarged fuselage for carrying oversized loads, and was used during the Apollo and Skylab programs for hauling spacecraft and other hardware from manufacturing plants to Kennedy Space Center and other NASA facilities. The aircraft will haul Space Shuttle hardware in a similar role.

The contract with Twin Fair is valued at \$2,935,000 and covers spares, ground support equipment and manuals, and flight crew and maintenance training. Twin Fair has delivered the aircraft to Hayes International Corporation at Birmingham, Alabama for airworthiness inspection prior to delivery to NASA. Flight crew and maintenance training will take place at Johnson Space Center flight operations facility at Ellington AFB near Houston.

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Terry White

For Release

NEWS RELEASE NO: 79-14

February 28, 1979

NASA SELECTS GE SUBSIDIARY FOR LIFE SCIENCES CONTRACT

The National Aeronautics and Space Administration has selected Management and Technical Services Co., Houston, a subsidiary of General Electric Co., for negotiations leading to the award of a cost-plus-award fee contract for the performance of Life Sciences Flight Payload Development, Engineering and Operations.

The contract will be for engineering, planning, technical management, operational support and acquisition of equipment to support a life sciences experiment program for flights aboard the Space Shuttle.

The contract will run from March 1979 through February 1984 and will be divided into three contract periods. The contractor's estimated cost for the first two-year period is approximately \$8.6 million and approximately \$22.9 million for the full five-year contract.

The Life Sciences Flight Experiments Program on the Shuttle will open a new era of medical, biological and performance research in space. Scientists, who are not astronauts, will be able to perform experiments during space flight.

The Life Sciences Flight Experiments Program is in the NASA Office of Space Science where it is managed by the Life Sciences Program Division. This contract is under the management and technical direction of NASA's Johnson Space Center, Houston.

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NASA-JSC

NASA News

LH-14

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March 1

Terry White

For Release

RELEASE NO: 79-15

Upon Receipt

NEW MEXICO LAKEBED AIRSTRIp NAMED AS SHUTTLE BACKUP LANDING SITE

The great white blotch in New Mexico's Tularosa Valley can be seen from the air for a hundred miles or more. Tourists drive out into the gypsum dunes from Alamogordo to view nearby White Sands National Monument.

The place seems like an illogical location for landing a spaceship, but a flat, hardpacked stretch running north and south across the white dry lakebed has been named the backup landing strip for NASA's Space Shuttle Orbiter, scheduled for first space flight in November.

The Northrup strip on the White Sands lakebed was chosen because it remains dry for most of the year. Moreover, Northrup strip is under the flight path of the critical first Earth orbit after a Shuttle launch. Should the Orbiter not be in a safe orbit, or some other emergency force a landing on the first orbit, the spacecraft would be slowed down by a deorbit rocket engine burn high over the South Pacific east of Samoa. As the Orbiter entered the Earth's atmosphere the flight path would cross Baja California and the Mexican state of Sonora until the

- more -

spacecraft was in the denser atmosphere and the crew would fly it "dead-stick" into Northrup Strip.

Shuttle Orbiter Columbia will make six orbital test flights before the Shuttle Transportation System becomes operational. The first four of these test flights will land at Edwards Air Force Base, California, and subsequent Orbiter landings will be on the 15,000-foot Shuttle runway at NASA Kennedy Space Center in Florida.

Edwards AFB has a large dry lakebed extending around one end of its main runway that is hard packed and allows an 11-mile rollout for a landing Orbiter. Winter rains can transform the dry lake into a wet lake, and since there is little natural drainage, water removal is mostly through evaporation.

Standing water on the lakebed at Edwards AFB prior to launch would shift the normal end-of-mission landing to Northrup Strip.

Plans are underway for installing a stiff-leg derrick adjacent to Northrup Strip for hoisting a landed Orbiter onto the top of the Boeing 747 carrier aircraft used by NASA to ferry Orbiters back to Kennedy Space Center for the next launch. Additionally, a ground station for the Shuttle microwave scanning beam landing system -- a landing and approach piloting aid -- will be moved to the Strip from Edwards AFB.

- more -

Other landing support equipment to be relocated at Northrup Strip include an S-Band communications van and a mobile tactical air navigation (TACAN) station to provide Orbiter crews with distance and bearing signals from the landing site.

Service workstands, office trailers, towing vehicles and other facilities would be brought to Northrup Strip for Orbiter retrieval and ferry operations. The total cost for installing the derrick and the electronic landing aids is estimated at \$1.5 million. Operational costs for retrieving an Orbiter will run about \$400,000, and up to 200 NASA and support contractor people would be temporarily assigned to the Alamogordo-Northrup Strip area for a retrieval.

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March 1, 1979

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NA-19
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Kay Ebeling

For Release

RELEASE NO: 79-17

Upon Receipt

AT 18 YEARS OLD SHE MANS A MISSION CONTROL CONSOLE

At age 18, Jackie Parker is the youngest flight controller in the history of manned spaceflight. She is also among the first group of women to man a console in the Mission Control Center at the NASA Johnson Space Center.

"I work in support of the DPS (Data Processing Systems) console," she says. "I'm in that position during ascent phase, which is launch and the first few hours of orbit." Her post is in the Mission Operations Control Room during upcoming Space Shuttle missions.

Eyes fixed on the console, Parker will monitor and respond to the five computers onboard the Space Shuttle. Like other controllers, she interacts with the computers for data to be uplinked or downlinked by telemetry.

During a Shuttle mission, she and other controllers in her section assess the health of the onboard and on the ground computer system which, in essence, controls major parts of the orbiting vehicle.

- more -

Parker has lived with the space program since childhood. Her father, author W. Dale Parker, retired from JSC in the early 1960's, so from an early age she has aspired to work in space, perhaps as an astronaut.

She was one of the 1700 women who applied during NASA's last astronaut recruiting, and she plans to apply again.

At age 14, Parker entered college to study math. On a gifted student program in the Florida school system, she had skipped the 9th grade and completed her high school credits in one year.

She completed the four-year degree program in three years, including math courses she'd missed in high school and taking 41 hours, mostly computer science, in two quarters. She graduated at age 17 from Florida Technological University (now University of Central Florida).

After working for NASA last summer as an intern computer systems analyst, Flight Control Division hired her as a flight controller in September.

Her favorite hobby is flying. "I got my pilot's license when I first turned 17," she says and laughs. "I learned to drive a car about a week after that. Now I'm interested in aerobatics."

A former member of Mensa, Parker drops comments into a conversation such as "Calculus is a breeze if you know your trig identities."

- more -

As to her future: There will be plenty more astronaut selections before she'll think she is too old to keep applying.

Photos available: S/79-28634
S 79-28632

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March 19, 1979

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release

RELEASE NO: 79-18

March 30, 1979

JSC EXPANDS CENTER TOUR

The NASA Johnson Space Center has added another stop on its public tour. The Space Shuttle Orbiter Mockup Laboratory is now part of JSC's "open house" visitor program. A full-size Shuttle Orbiter mockup and a payload bay training facility are in the lab.

Visitors need first to go to the JSC Exhibit Hall to pick up a folder with driving directions to the new stop, where an escort will explain the facility.

JSC's open house, in addition to the Exhibit Hall, includes Mission Control Center and the Mission Simulation and Training Facility. Open house runs from 9 a.m. to 4 p.m. seven days a week.

Call ac 713 483-4321 for additional tour information.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

X

Terry White

For Release

RELEASE NO: 79-19

March 28, 1979
2:00 p.m. CST

NASA PICKS SERV-AIR TO MAINTAIN 747 CARRIER AIRCRAFT

The NASA Johnson Space Center, Houston, has selected Serv-Air, Inc., of Greenville, Texas, for award of a contract covering maintenance of the Boeing 747 transport (NASA 905) used to ferry Shuttle Orbiter spacecraft from one location to another.

Most of the maintenance work will be done by Serv-Air at the NASA Dryden Flight Research Center at Edwards Air Force Base, California. The contract also covers logistics, quality assurance and engineering support.

JSC's Aircraft Operations Division will manage the contract, estimated to total approximately \$573,000 during an initial 19-month period.

Other bidders for the contract were American Airlines, Inc., Tulsa, Oklahoma, and Northrop Worldwide Aircraft Services, Inc., Lawton, Oklahoma.

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NASA-JSC

NASA News

LH-14

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

APR 8

Kay Ebeling

For Release

RELEASE NO: 79-20

April 8, 1979

ALSO RELEASED AT NASA HEADQUARTERS

SCHOOLING OF ASTRONAUTS, 35 NEW CANDIDATES IS VARIED, EXCITING

A group of 35 Space Shuttle astronaut candidates has completed months of classroom work and is moving into engineering assignments at the Johnson Space Center. In training since July 1978, the candidates will become full-fledged astronauts in July 1980.

Flight crews and flight controllers at JSC are gearing up for intensive training in Shuttle cockpit simulators and in the Mission Control Center here at Houston.

Candidate training coordinator Tom Kaiser said of the classes: "They've been more like briefings than classes. This is the first time we've had this thorough a training program."

"This morning, I was counting the years I've been in class like this," said Steve Hawley, astronomer and mission specialist candidate.

- more -

"There are no real tests, but you recognize you're going to need this information," added geologist Kathy Sullivan.

JSC brings in instructors from universities or other NASA centers to conduct courses titled: Ascent Aerodynamics; Entry Aerodynamics; Space Physics; Tracking Techniques; and Spaceflight Physiology.

Veteran astronauts deliver lectures on such topics as: How to be a CAPCOM (capsule communicator) and other experienced NASA personnel lead sessions in: "Washington Roundup;" "Evolution of a JSC Budget;" and "People and Requirements, It Takes a Bunch to Make Things Work in NASA."

Trainers say they are putting together a videotape library of the classes for use by all JSC employees.

Now that the candidates are getting out of the classroom, their training takes on a new emphasis. "They're being put straight to work like the rest of us," said astronaut Ed Gibson, who coordinates the candidates' technical assignments.

"The first months, they were in more of an observer mode," he said. "Now they'll be assuming responsibility the same as anybody else in the office."

Candidate Hawley has been working on software for payloads on orbital test flights, an assignment that "evolved into how to support operational payloads." Sullivan has been working on a similar assignment for the second flight.

Pilot Fred Gregory is working on Orbiter enhancement, trying to find an ideal cockpit. George Nelson, an astronomer, is working on procedures for getting in and out of a spacesuit.

They all get excited when they talk about the training. "The scientific courses have been fascinating," said Gregory.

"There's an overwhelming amount of information, and it's important to learn every facet," said Nelson.

"The best way to learn how to do it is to go out and do it," said Hawley.

They apply abundant energy to keeping up with a hectic schedule -- flying in T-38's, working one-on-one with veteran astronauts, keeping current in their specialties and keeping fit. Now and then, they find an hour for racketball or other recreation.

With the Space Shuttle's first flight expected before the end of this year the first astronaut crews have begun lesson sequences in the Shuttle Mission Simulator. The 35 astronaut candidates are observers.

DEVIL'S ADVOCATES

Flying a spacecraft calls for total commitment and preparation calls for comprehensive, integrated training, said James Bilodeau, chief of crew training at JSC.

Eight hours a day, until the launch, the astronauts will sit in the cockpit of the fixed-based and the motion-based simulators going through flight procedures. Teams of instructors can feed up to 4,500 malfunctions into a training run. The astronauts respond to each malfunction, carrying out procedures that will keep the Orbiter alive and well.

- more -

The lesson plan will cover nine months "not counting real-world problems cropping up," Hughes said. By the launch date, the crews will be prepared for nearly any emergency.

"We are at the very bottom of an incredible amount of stuff they will have to learn," said Frank Hughes, crew training specialist.

The simulation instructor teams work from scripts, sheets that look like working TV scripts. The time of the event is in the left column and a description is in the right. Instructions read: "Delay OMS 1 burn due to pre valve fail;" "Gain switches to low during load relief;" or "Late engine out."

Instructors have spent six months learning how to harass the astronaut crews during simulator exercises.

The instructors sit before the cathode ray screens of the simulator computer watching color graphic and numerical displays. Each instructor has data to monitor. One is checking times of cryogenic pressure cycles, another eyes maneuver rocket systems. They concentrate; eyes always fixed on the screens. They wait for the precise moment to play the devil's advocate.

The constant hum of a roomful of computer databanks drowns out nearby sounds. Occasionally, a loudspeaker voice announces incoming calls. The instructors listen over headphones to communications between the cockpit and other instructors.

- more -

In the cockpit, two astronauts run through a procedures verification -- the minutes prior to the de-orbit burn. An astronaut candidate looks on, absorbing everything. The simulated sound of maneuver jets is heard. "OK, OMS engine is on," says the pilot. "I'll burn the engine in manual," says the commander. He grabs the stick and the "current orbit" numbers decrease. With the exercise completed, the instructors reset the computer, and the crew gets ready to perform the task again.

Next morning another commander and pilot sit at the cockpit in the simulator. It is two minutes before launch. There is the sound of engines firing, and on the control panels the velocity and altitude are going up.

An instructor at one of the consoles puts in an auxiliary power unit malfunction command and emergency lights come on in the cockpit announcing "APU underspeed." The hydraulic pressure lights go on.

The pilot throws the correct switches and the emergency is over.

"These malfunctions will get more difficult in the next few weeks," Hughes says.

The system clears and the crew is ready to launch again with more "what-ifs?"

- more -

SURROGATE SPACECRAFT

When the candidates become full fledged astronauts, some will also use a different facility, a high-fidelity trainer at JSC, that acquaints astronauts with the close quarters aboard the Space Shuttle Orbiter.

The Orbiter's mid-deck serves as living room, dining area, kitchen, den and bedroom; "all but the drivers' seat and workshop," said Bob Bond, trainer manager. Bond pointed out the drawers in the walls where suitcases go and hooks where orbiting crews will hang in their sleeping bags at night.

Crew members will use the trainer for habitability exercises: food preparation and finding where to stow things -- from instruments to trash. There are 15 lessons for each crew, such as how to operate on-board cameras and emergency procedures for loss of cabin pressure.

The astronauts also will use the trainer to practice going through an airlock to work in the 4.5-by-20 meter (15-by-65 foot) payload bay. Crew members crawl through an opening in the mid-deck and lock their feet into the ceiling.

Then, reading the controls, which on Earth are upside down, they close the hatch, depressurize the airlock, open the outside hatch, and push out to the payload bay.

After 1980's orbital flight tests, living quarters on the Shuttle will be made more spacious. Extra water tanks to supplement the water obtained from the fuel cells will be removed along with

- more -

a test pallet that contains data from the vehicle. This will provide room for a set of bunks, "a personalized cocoon you can slide into to read a book or play music," Bond said.

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Note:

Photographs to illustrate this news release will be distributed without charge only to media representatives in the United States. They may be obtained by writing or phoning:

Public Affairs Audio-Visual Office
Code AP3, Johnson Space Center
Houston, TX 77058

Telephone No: 713 483-5111

Photo Nos: S78-38409
S78-35488
S78-35502
S78-33676

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release

RELEASE NO: 79-21

April 18, 1979
2 p.m. CST

JSC SELECTS METRO SERVICES FOR LOGISTICS CONTRACT TALKS

The NASA Johnson Space Center, Houston, has selected Metro Contract Services, Inc. of Houston for negotiations leading to the award of a cost-plus-award-fee contract covering logistics support services at the Center.

The initial year of the planned three-year program will run from May 1979 through April 1980. The estimated cost of the first year is approximately \$1.7 million. JSC's Center Operations Directorate will manage the contract.

Other bidders were Mercury, of Tustin, California, and Technical Contract Management, Inc., Austin, Texas.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

APR 18

Robert Gordon

For Release

RELEASE NO: 79-22

April 18, 1979

JSC HOSTS THE 13th AEROSPACE MECHANISMS SYMPOSIUM

The 13th Annual Aerospace Mechanisms Symposium will be held at JSC on April 26-27, 1979 at the Gilruth Recreation Center.

This is "the only symposium in the world devoted exclusively to the interchange of information relative to design, fabrication, testing, and the operational use of mechanisms in aerospace and related fields." The conference is sponsored by NASA, Lockheed Missiles and Space Co., Inc. and California Institute of Technology. Mr. Alec C. Bond, Associate Director for Program Support of the Engineering and Development Directorate, will be the JSC Host Chairman.

The program starts at 8:30 a.m. on Thursday, April 26 and 8:00 a.m. on April 27 and concludes at approximately 5:00 p.m. on both days. Friday's last two hours will be devoted to a tour of the mockup and integration laboratory, Skylab trainer and Shuttle simulator building, and the space environment simulation lab.

Dr. Anna L. Fisher, astronaut candidate will be the banquet speaker. She will talk on her experiences in the Astronaut Training Program. The banquet program begins at 6:30 p.m. at the Sheraton Kings Inn.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

APR 25

Terry White

For Release

RELEASE NO: 79-23

April 25, 1979
2 p.m. CST

NASA SIGNS ADD-ONS TO ORBITER CONTRACT

The NASA Johnson Space Center, Houston, Texas, has signed two supplemental agreements to its contract with Rockwell International Corporation Space Division, Downey, California, for the Space Shuttle Orbiter.

The first supplement, valued at about \$10.9 million, covers modifications to the Orbiter/payload communications system, changes in Orbiter tire testing, and changes in test requirements for the Main Propulsion Test Article.

The second supplement covers extension of the Shuttle Flight Simulation Program from October 1, 1977 through March 15, 1980, and is valued at about \$11.5 million.

Value of the Rockwell Orbiter contract is brought to approximately \$3,399,836,141 by the two supplements.

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NASA News

24-14

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

May 4

Terry White

For Release

RELEASE NO: 79-24

May 4, 1979

JSC DEPUTY DIRECTOR SJOBERG RETIRES

Johnson Space Center Deputy Director Sigurd A. Sjoberg will retire from federal service effective May 18 after 37 years with the National Aeronautics and Space Administration and its predecessor the National Advisory Committee for Aeronautics.

Sjoberg will join OAO Corporation as Director and General Manager of OAO Corporation, Houston Operations. OAO is an engineering and computer software firm based in Beltsville, Maryland.

Sjoberg, 59, joined NACA in 1942 as an aeronautical engineer. He holds a BS in aeronautical engineering from the University of Minnesota.

His NASA career has spanned high-performance aircraft research to manned spaceflight programs up to the Space Shuttle currently under development. He came to Houston in 1962 when the Center was relocated from Hampton, Virginia. He was named JSC deputy director in 1972, and had been director of flight operations since 1969.

"I've had as interesting and fruitful career as anyone could hope for," said Sjoberg. "Those years of involvement in our first ventures into space and manned exploration of the Moon are a part of my life that would be hard to match in any other field."

Sjoberg and his wife Elizabeth have three sons: Eric, 31, Stephen, 29, and Robert, 25.

A new JSC deputy director has not been named.

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NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

May 1

X

Kay Ebeling

For Release

RELEASE NO: 79-25

May 1, 1979

NASA AIRCRAFT SURVEYS ARCTIC ICE

Most of man's activities in the Arctic presently occur during a brief summer period when ice-free conditions exist. However, full development and recovery of the vast oil and gas resources in the Arctic region will be dependent upon development of techniques that enable year-round operation in the Arctic ice environment.

The Lockheed NC-130B aircraft (NASA 929), flown by Johnson Space Center, returned March 27 from a three-week mission in Alaska for the Arctic Microwave Ice Properties Experiment. More than 20 American and Canadian organizations, including NASA Lewis and Langley Research Centers, are involved in this experiment.

AMIPE is developing interactions between active and passive all-weather sensors that scan Arctic ice phenomena for commercial use. Data gathered are now being analyzed at a number of government and civilian facilities around the country.

- more -

According to mission manager Jim Lindemann, JSC's involvement in this experiment is significant and essential. Eight people from Johnson Space Center manned the NC-130B aircraft installed with NASA Langley sensors for the mission to the Arctic. They flew 22 flights in 24 days, traversing over 25,000 nautical miles of the globe in 91 hours.

The NC-130B's base of operations while in Alaska was Elmendorf AFB at Anchorage. Flights went over different locations around the Canadian and Alaskan Coast, covering various types of ice and ice formations. Locations overflown were the Mackenzie Delta region of the Beaufort Sea, the GEOS satellite track over Norton Sound, and the Bering Sea ice edge and floeberg region. In each of the areas flown extensive surface truth measurements were made, and samples were collected by people on the ice.

Other bases or airports used during the mission were Langley AFB, Virginia; K.I. Sawyer AFB, Michigan; Minneapolis Airport; Eielson AFB, Fairbanks; King Salmon, Alaska; Inuvik, Northwest Territory Airport, Canada; Galena, Alaska; Edmonton, Alberta, Canada; McChord AFB, Tacoma, Washington; and Peterson Field in Colorado Springs, Colorado.

The NC-130B also took time on its trip home to complete a snow study project in California. The JSC team accomplished all of the planned aircraft mission objectives, Lindemann said.

The AMIPE crew plans to return to the Arctic next winter to continue this experiment.

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Photos S79-31303 and S79-31305 may be ordered from JSC Public Information Office ac/733 483-4231.

NASA-JSC

NASA News

National Aeronautics and
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LA-14

No Date 1

Kay Ebeling

For Release

NEWS RELEASE NO: 79-26

Upon Receipt

JSC DEPUTY DIRECTOR OF SAFETY ASSIGNED TO THREE MILE ISLAND TASK GROUP

Johnson Space Center's William M. Bland, Jr., is on special assignment in Washington to the President's Commission on the Accident at Three Mile Island.

Bland is serving on the technical staff, one of three groups formed to support the 11-member Commission created by Executive Order April 11. The Commission is to report its findings back to the President October 25, and Bland will be traveling between Houston and Washington during that period.

"We are trying to establish the cause of the accident," Bland said. A list of his group's official duties includes evaluation of operator training, equipment maintenance, quality assurance inspection and audits, control room displays, and instrument calibrations.

"And it will probably broaden as we go," Bland said.

Control room displays and operator training have already been cited by the Nuclear Regulatory Commission as major causes of the incident at Three Mile Island.

Before a space flight, mission equipment is tested in conditions as similar to space as possible. Bland's job, through the Apollo program and

-more-

News Release No: 79-26

and now with the Space Shuttle, is assuring that equipment meets established quality, reliability and safety levels.

Bland is Deputy Director of Safety, Reliability, and Quality Assurance at JSC. He started with the space program with NASA's predecessor NACA (National Advisory Committee for Aeronautics) in 1947, and has served on the Mercury, Apollo and now the Shuttle programs.

The President's Commission identified its five main tasks May 10: event identification, system safety, public health, public information, and institutional factors--the political, social, and economic environment.

"Initially I will be assisting on Task One," Bland said. "At the same time I will be working on system safety."

The Commission's staff director is Bruce Lundin, former NASA Lewis Research Center director.

Bland received a call from Washington May 1, and was in his new office in the capital by May 7. He has already made one trip to Three Mile Island, "getting orientation briefings," interviewing people from the area and doing preliminary investigations, "although in some areas the radiation level is such that we can't get in for awhile," he said.

The Commission's objectives include a technical analysis of the event and its causes, an assessment of emergency preparedness, how the public's right to information was served, and how future incidents should be handled.

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NASA-JSC

NASA News

National Aeronautics and
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Langley Research Center
Hampton, Virginia 23665
AC 804 827-3966

RELEASE NO. 79-30

For Release:

Jean Drummond
(804) 827-2934

May 14, 1979

NASA LANGLEY SUPPORTS SMALL BUSINESS

Hampton, Va.--President Carter recently proclaimed the week of May 13-19 as Small Business Week. Of the 14 million businesses in the United States, more than 13 million of them are small, including some three million farms. Together they provide employment for over half the business labor force and account for more than 48 percent of the gross business product.

At NASA's Langley Research Center, small businesses are strongly supported. In 1978, small firms were awarded over \$48 million in contracts. Joseph F. Braig, Small and Minority Business Staff Specialist, Acquisition Division, said "In the first six months of 1979, more than \$27 million in contracts were awarded to small businesses. Langley can also be proud of the fact that, to date, over \$10 million of awards toward the construction of the National Transonic Facility have been made to small business firms." The goal for fiscal year 1979 is \$50 million.

Under these contracts, small firms provide services such as base maintenance, warehousing, transportation, security guards, ground maintenance, custodial, data management, pressure testing, and research and development.

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

LH-14

May 25

L.

Robert Gordon

For Release

RELEASE NO: 79-36

May 25, 1979

RMS CONTRACT AWARD

NASA has signed a letter of contract with the Canadian Commercial Corporation for the follow-on production of three remote manipulator systems for the Space Shuttle. The work is to be performed by Spar Aerospace Limited, of Toronto.

The letter of contract is expected to be replaced later this year with a definitive contract valued at approximately \$60 million. The contract calls for three remote manipulator systems, ground support equipment, and logistics support for the Shuttle.

The bulk of the work is to be performed at Spar's facilities in Canada with a portion subcontracted to other Canadian and U.S. firms.

The manipulator system is a 50-foot arm-like device that will allow astronauts in the Shuttle Orbiter to deploy or retrieve payloads in space. Delivery of the three systems to the Kennedy Space Center, Florida, is planned between 1982 and 1984.

-end-

NASA-JSC

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Robert Gordon

For Release

RELEASE NO: 79-37

June 1, 1979
5 pm EDT

ALSO RELEASED AT NASA HEADQUARTERS

SKYLAB MANEUVER PLAN

NASA is studying maneuvers to shift Skylab into a lower-drag attitude which could add as much as 10-12 hours to the space vehicle's orbital lifetime. By changing Skylab from a high-drag to a low-drag one for eight hours, for example, it may be possible to delay reentry by about four hours. This is equivalent to nearly three revolutions around the Earth, during which time the Earth's rotation would shift the prospective reentry area by several thousand miles.

Skylab is expected to reenter between June 27 and July 21. As many as 500 pieces of hardware may survive reentry and reach the surface, distributed within a footprint approximately 161 kilometers (100 miles) wide and 6,437 kilometers (4,000 miles) long. NASA estimates the chance of injury from this debris to be about 1 in 150; that is 150 Skylab reentries would be likely to cause one injury.

- more -

On the last day of Skylab's flight, if the most populous areas of the Earth (Europe and Asia) lie under the orbital path on which reentry is expected, drag modulation maneuvers offer the possibility of delaying the reentry to subsequent orbit, shifting the likely reentry orbit to an orbit passing over less population, thereby further reducing the statistical hazard of damage or injury.

Studies indicate, that beginning about 24 hours before reentry, it may be possible to identify what areas of Earth lie under the more likely reentry orbits. Even in the last hours, however, it will be impossible to predict accurately the geographic location where Skylab debris might reach the surface.

In order to preserve the action to exercise drag modulation NASA plans to reorient Skylab later this month toward a torque-equilibrium attitude that balances the increasing areal dynamic forces and permits the relatively weak onboard systems to maintain the spacecraft stability. If this initial maneuver is successful and if the onboard systems do not degrade further, the Skylab attitude should remain under ground control up to the last few hours of orbital life. Drag modulation for reentry delay would only be attempted if a significant hazard reduction were possible and if failure of the maneuver would not increase risks of injury.

- end -

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release

RELEASE NO: 79-38

June 1, 1979
2 pm CDT

NASA SIGNS SUPPLEMENT TO IBM CONTRACT

The NASA Johnson Space Center, Houston, Texas, has signed a supplemental agreement to its contract with IBM Federal Systems Division, Gaithersburg, Maryland, covering 12 changes in Shuttle avionics software.

Most of the changes are refinements in software programming resulting from Orbiter avionics testing on Orbiter vehicles at Marshall Space Flight Center and Kennedy Space Center, and at other component test sites.

The supplement is valued at \$9,115,318, and brings the total value of the cost-plus-award-fee IBM contract to \$114,018,030.

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NASA News

National Aeronautics and
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AC 713 483-5111

June 4

LH-14

Robert Gordon

For Release

RELEASE NO: 79-39

June 4, 1979

KLEINKNECHT ASSUMES NEW ROLE

Kenneth S. Kleinknecht, veteran NASA manager for manned space-flight projects, has been named to head Johnson Space Center operations at the Kennedy Space Center, Florida, to complete the manufacture of the Space Shuttle Orbiter, Columbia. He will direct installation of the thermal protection tiles and installation and modification of internal vehicle systems.

Kleinknecht, who joined the National Advisory Committee for Aeronautics (forerunner of NASA) in 1942, will report to KSC late this month from Paris, France, where he has been stationed as Deputy Associate Administrator for Space Transportation Systems (European Operations). That will remain his permanent assignment.

Astronaut Robert Overmyer of the Johnson Space Center will be deputy manager to Kleinknecht in the temporary manufacturing assignment at KSC. Overmyer has been a NASA astronaut since 1969. He is a colonel in the U.S. Marine Corps.

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NASA-JSC

NASA News

National Aeronautics and
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NASA
LH-14

Terry White

For Release

RELEASE NO: 79-40

June 6, 1979
2 p.m. CDT

NASA EXTENDS NORTHROP AIRCRAFT MAINTENANCE CONTRACT

The NASA Johnson Space Center, Houston, Texas, has extended for a third year a contract with Northrop Worldwide Aircraft Services, Inc. of Webster, Texas, covering maintenance and modification of Center aircraft operating out of Ellington AFB, Texas.

The extension brings the total estimated costs of the cost-plus-award-fee Northrop contract to \$6,555,000, with a maximum award fee of \$317,000 for the third year.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

June 6

24-14

Kay Ebeling

For Release

RELEASE NO: 79-41

June 6, 1979

McCALL'S SPACE MURAL TO BE DEDICATED JUNE 14

Space artist Bob McCall's 72-by-16 foot mural, "Opening the Space Frontier--the Next Giant Step," will be dedicated June 14 at 11 a.m. at the Johnson Space Center Visitors Center, Building 2 Auditorium.

McCall, who has been painting the mural from a scaffold in the visitors center since January, will give a 45-minute talk on his career. "I will review how I came to be so committed to documenting the space program," he said.

His talk will be illustrated by slides of his past work which includes the Viking missions to Mars stamp, the painting "Space Station One" for 2001, A Space Odyssey, space murals at the National Air and Space Museum in Washington, and at NASA's Dryden Flight Research Center in California, and his book of paintings Our World in Space, with text by Isaac Asimov.

Asimov calls McCall "the artist in residence of outer space." McCall has documented the space program in art since the first Mercury flights of 1961.

JSC is co-sponsoring the event with the Cultural Affairs Council of the Clear Lake Chamber of Commerce.

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Milton Reim

For Release

RELEASE NO: 79-42

June 7, 1979

ENGLAND RETURNS TO ASTRONAUT PROGRAM

Dr. Anthony W. England returned this week to the Johnson Space Center where he is rejoining the ranks of the scientist-astronaut program, effective June 3.

In August 1972, England left the NASA program to become a research geophysicist with the U.S. Geological Survey, Denver, Colorado. He went to the U.S.G.S. in Reston, Virginia August 1976, as deputy-chief of geochemistry and geophysics.

England said he was happy to be back at JSC. "I am looking forward to getting back into training and making a Shuttle flight," he said.

He was selected as a scientist-astronaut by NASA in August 1967. He completed the initial academic training at NASA and a 53-week course in flight training at Laughlin Air Force Base, Texas. He was a member of the support crews for the Apollo 13 and 16 flights.

England's background is in geology and physics. He earned his Ph.D. in that field from the Massachusetts Institute of Technology in 1970.

-end-

NASA-JSC

NASA News

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National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release

RELEASE NO: 79-43

June 8, 1979
2 p.m. CDT

PAN-AM CONTRACT RENEWED AT JSC

The NASA Johnson Space Center, Houston, Texas, has renewed its contract with Pan American World Airways, Inc., Aerospace Services Division of Houston covering plant maintenance and operations support service at the Center.

Pan Am is responsible for operation of utility systems and maintenance of utilities, buildings, roads, ditches and special equipment at the Center.

Beginning May 1, 1979 and ending April 30, 1980, the cost-plus-award-fee contract is valued at an estimated \$8,529,000. Pan Am employs 274 people for the contract.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

June 11

24-14

X

Charles Redmond

For Release

RELEASE NO: 79-44

June 11, 1979

SUMMER SPACE PROGRAM BRIEFINGS

The Johnson Space Center Public Affairs Office will be holding special briefings on the space program for educators each week through August 20.

The briefings will take place each Monday, Wednesday and Friday at 10 a.m. at the space center. They will cover lunar science, remote sensing and the Landsat satellite, and the Space Shuttle System. Free materials will be available at each session.

Attendance will be limited to the first 35 to register for each session. Attendance at the sessions will qualify educators to use the special lunar sample kits which have been prepared using real material from the moon.

Additional information may be obtained from Jim Poindexter at the Public Services Branch, Code AP4, Johnson Space Center, or by calling AC 713/483-4241.

-end-

NASA News

LH-14

National Aeronautics and
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X

Robert Gordon

For Release

RELEASE NO: 79-46

June 15, 1979

GARTRELL RETIRES

Harold E. Gartrell, assistant manager of the Shuttle Payload Integration and Development Office at the NASA Johnson Space Center has announced his retirement, effective immediately. He will join the Martin Marietta Aerospace Corporation in Denver, Colorado.

Gartrell has held key management positions at JSC since joining the space agency in 1963. He has worked in advance planning, Skylab and Shuttle, before assuming his current position as assistant manager for payload integration.

Gartrell, a native of Ft. Supply, Oklahoma, graduated from the West Point in 1953. He is married to the former Darlene Rowland. The Gartrells have two children, Alan and Annette.

-end-

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Milton Reim

For Release

RELEASE NO: 79-50

August 1, 1979

NASA TO RECRUIT SPACE SHUTTLE ASTRONAUTS

The National Aeronautics and Space Administration will begin accepting applications for Space Shuttle astronauts on an annual basis. This year, the period for submitting applications by civilians will begin October 1 and end December 1.

Depending on the needs of NASA for pilots and mission specialists, a selection will be made from rosters of qualified applicants resulting from this announcement. The rosters will be established annually.

Successful applicants will be asked to report to the Johnson Space Center, Houston, Texas in mid-1980 for a one-year training and evaluation program as astronaut candidates, after which pilot and mission specialist astronauts will be selected.

Selected applicants will be assigned to the Astronaut Office and placed in responsible technical or scientific positions where they will receive assignments to the Space Shuttle Program and continue work in their scientific or technical fields, where practicable.

Pilot astronauts will control the Space Shuttle during launch, orbital maneuvers and landings and be responsible for maintaining vehicle systems. Mission Specialist astronauts will have the overall responsibility for the

-more-

coordination, with the Commander and Pilot, of Shuttle operations in areas of crew activity planning, consumables usage and other Shuttle activities affecting experiment operations. Mission specialists will continue in their chosen fields of research and will be able to propose, develop, and conduct space experiments.

Pilot applicants must have a bachelor's degree from an accredited institution in engineering, biological or physical science or mathematics. They must have at least 1000 hours of "pilot-in-command" time in high performance jet aircraft, must pass a NASA spaceflight physical, and be between 64 and 76 inches in height.

Mission specialist applicants, while not required to be pilots, must meet the same educational requirements and have at least three years of relatable experience. An advanced degree may be substituted for experience. Mission Specialist applicants must pass a NASA spaceflight physical and be between 60 and 76 inches in height.

Civilians may obtain application forms and information material by writing to Astronaut (Mission Specialist) Candidate Program or Astronaut (Pilot) Candidate Program, Code AHX, NASA Johnson Space Center, Houston, Texas 77058.

Military personnel should apply through their respective military department, not directly to NASA. Procedures will be promulgated by the service branches.

Current regulations require that preference for appointment to Astronaut Candidate positions be given to U.S. citizens when there is an adequate source of well qualified citizens available. Qualified minority and women applicants are encouraged to apply.

Twenty-seven astronauts are currently available as Space Shuttle crewmen, including 11 scientists. An additional 35 astronaut candidates selected in 1978 are in training to qualify for selection to Space Shuttle crews. The number of new candidates to be selected in 1980 will be based on mission requirements and operational needs.

-end-

NASA News

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Charles Redmond

RELEASE NO: 79-51

For Release

August 10, 1979

CHARLESWORTH NAMED ACTING DEPUTY DIRECTOR OF JOHNSON SPACE CENTER

Clifford E. Charlesworth has been named acting Deputy Director for the Johnson Space Center effective today. Charlesworth replaces Sigurd A. Sjoberg, who retired May 18.

Charlesworth will leave his post as deputy manager, Shuttle Payload Integration and Development Program Office, where he has been for the past three years. As deputy manager of SPIDPO, Charlesworth was responsible for the coordination between Space Shuttle users and the Space Shuttle technical management here at JSC.

Prior to his SPIDPO assignment, Charlesworth, 48, was manager of the Earth Resources Program Office at JSC. ERPO was the NASA lead office for the development and application of Earth resources information. From 1970 through 1972 Charlesworth was deputy manager for the Skylab program.

Charlesworth joined NASA in Houston in 1962 as a flight controller. He served as a flight director for the Gemini and Apollo missions and was one of the flight directors for the Apollo 11 mission, the first to land men on the Moon, in 1969.

He holds a bachelor of science degree in physics from Mississippi College.

Charlesworth and his wife, Jewell, have a son, David, 18, and a daughter, Leslie Ann, 16. They live in Friendswood, Texas.

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NASA News

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Charles Redmond

For Release

RELEASE NO: 79-52

August 24, 1979

JSC SELECTS PAN AMERICAN FOR ENGINEERING SUPPORT CONTRACT TALKS

The NASA Johnson Space Center, Houston, has selected Pan American World Airways, Inc., Aerospace Services Division, Cocoa Beach, FL, for negotiations leading to award of a cost-plus-award-fee contract for engineering support services at Johnson.

Pan American will be responsible for providing engineering design support for facilities and test programs at JSC. The contract amount is approximately \$1.3 million and covers the time from September 1, 1979 through August 31, 1980.

Other bidders were Allstates Design and Development, Houston, Collins International Service Company, Dallas, Kentron International, Dallas, and Rust Engineering Company, Birmingham.

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LH-14

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Robert Gordon

RELEASE NO: 79-55

For Release

September 10, 1979

NASA Tests New Space Maneuvering Backpack

NASA astronauts and engineers at the Johnson Space Center this week are evaluating a high fidelity mockup of a Buck Rogers style maneuvering unit designed to provide astronauts the ability to move around and work outside the Space Shuttle Orbiter in the 1980's.

The device, officially named the Manned Maneuvering Unit, fits on the back of spacesuited astronaut and furnishes him the ability to move around in the weightless environment of space. Nitrogen gas jets controlled by the astronaut provide the directional movement.

This is a third generation flying machine, an improvement over units designed for the Gemini and Skylab programs.

Ed Whitsett, manager of the maneuvering unit for the Center's crew systems division, said the new high fidelity mockup arrived last week

from the manufacturer, the Martin Marietta Corporation, Denver, Colorado. Although this unit will never fly, it has all the working mechanical parts necessary for crew operation and evaluation. Evaluations are being conducted in the crew system Building 7 laboratories.

The purpose of this three-month long evaluation and verification period, Whitsett said, is to check out the backpack with different sized astronauts, including some of the female astronaut candidates. These tests include fit checks and the mechanical operation of the unit's extendible arms which telescope for individual fit and to determine astronaut visibility and reach while using the unit.

In addition Whitsett anticipates tests will be made with the planned Orbiter work station from which astronauts may be called upon to use in the event of repairs or work outside the vehicle.

All systems of the unit, with the exception of the gas jets and the electrical parts, are workable. This includes the mechanical latches, the folding arms, switches and hand controllers. The hand controllers are similar to the Apollo type used by astronauts to control the Apollo command module.

One of the verification tests recently performed by Astronaut Bruce McCandless is the compatibility of the maneuvering unit with the astronaut and his self contained portable life support system (backpack). This has the suited astronaut with his life support system back into the maneuvering unit as it would be located in the

cargo bay of the Shuttle Orbiter. This action completes the mechanical latching of the maneuvering unit to the astronaut life support backpack. This is like backing into a phone booth with a large knapsack on your back.

This test went well and McCandless said he was very pleased with the operation. He said the use of this three dimensional mockup is "the proof of the pudding." It is one thing looking over detailed engineering drawings but it is another thing having a high fidelity mockup to work with, he said.

If during this evaluation period changes or modifications are determined necessary, such changes will be forwarded to the contractor for inclusion in the flight units. Delivery of the first flight unit to the NASA Kennedy Space Center in Florida is planned for early 1980.

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LH-14

Robert V. Gordon

For Release

RELEASE NO: 79-58

September 20, 1979

ASTRONAUTS MAY REPAIR ORBITER HEATSHIELD IN FLIGHT

Two approaches to Shuttle Orbiter heatshield tile repair in orbit are under study at the NASA Johnson Space Center in Houston. Although engineers are confident that the tiles will withstand the rigors of launch into space, the studies are aimed toward having repair techniques and tools ready as a contingency against flight delays.

The two concepts under study would require Orbiter crewmen to go outside the spacecraft in space walks to make repairs before reentry into the Earth's atmosphere.

JSC Director Christopher C. Kraft said, "We have confidence in the Orbiter thermal protection system and expect to fly the early orbital missions as planned. But at the same time we think it prudent to be prepared to make in-orbit tile repairs should the tile certification situation not come up to expectations."

- more -

On the first flight the aerodynamic pressures are only 70 percent of later flights, so the inspection and repair might be more important for flights two and three.

Thousands of heat-resistant blocks cover the underpart and sides of the Shuttle Orbiter. If some were damaged during launch the tiles may have to be patched before the Orbiter could safely reenter the Earth's atmosphere, depending on the extent of damage.

"One lesson we learned from Skylab was that we could do repairs in orbit by going outside in spacesuits," said Shuttle engineer Reg Machell. "Orbital inspection and repair is being considered as a kind of insurance against tile damage."

Machell's team is looking at two ideas for tile inspection and repair. The first concept calls for an extendable boom to be attached to the Orbiter's 16-meter (50-foot) remote manipulator arm. Television cameras on the boom would feed a closed-circuit picture of tile condition to the crew in the cockpit. The same boom also could be fitted with a work station or platform from which an astronaut wearing a spacesuit and life-support backpack could repair damaged tiles.

The second concept under consideration calls for an astronaut wearing a gas-jet maneuvering backpack to "fly" out and around the Orbiter to inspect the tiles and make repairs

where necessary. The maneuvering backpack, officially named the Manned Maneuvering Unit, is an improved version of one test flown inside the Skylab orbital workshop during the second and third astronaut visits in 1973-74.

Both concepts call for the ability to detect damage measuring 26 square centimeters (4 square inches) or larger in the high-temperature reusable insulation that covers the Orbiter's belly, the underside of the wings and the vertical stabilizer's leading edge.

Repair kits under consideration include spray-on silicon carbide, a cure-in-place epoxy foam for replacing missing tiles, and a pre-cured ablator for bonding into areas with greater damage.

Studies to design a tile repair kit are being made by General Electric Company, Reentry and Environmental Systems Division, Philadelphia; Martin-Marietta Aerospace, Denver Division; and McDonnell Douglas Corp., McDonnell Douglas Astronautics Company, Huntington Beach, California. Total cost of the three separate studies, which are to be completed in ten weeks, is estimated at \$250,000.

Along with inspection, the Johnson engineering team is also looking at tools, techniques and ancillary equipment needed for suited crewmen to carry out repairs while outside the

- more -

spacecraft. Space Center and aerospace industry engineers will study the various concepts and techniques through the end of September.

The first Space Shuttle orbital flight likely will be in the spring or summer of 1980 from NASA's Kennedy Space Center in Florida.

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NASA News

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Terry White

For Release

RELEASE NO: 79-66

October 29, 1979

ALSO RELEASED AT AMES RESEARCH CENTER

MATSCO GETS NASA LIFE SCIENCES PAYLOADS CONTRACT

The National Aeronautics and Space Administration has negotiated a contract with Management & Technical Services Company (MATSCO, a subsidiary of General Electric). The contract is for Life Sciences Payload Development Engineering and Operations Support to the Space and Life Sciences Directorate at Johnson Space Center, Houston, Texas, and to the Life Sciences Directorate at the Ames Research Center at Moffett Field, California.

The contract period of performance is March 1979 through September 1980. The negotiated estimated cost and fee for the eighteen months is approximately \$7.2 million. This contract is the first of three increments for a total contract performance period through February 1984.

MATSCO will provide engineering, planning, technical management, operational support and acquisition of equipment to support a life sciences experiment program for flights aboard the Space Shuttle.

The contract will be under the management and technical direction of the NASA Johnson Space Center, Houston, Texas.

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NASA News

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Robert Gordon

RELEASE NO: 79-73

For Release

December 11, 1979
2 p.m. CST

ORBITER INTEGRATED TEST

"Columbia," the first Space Shuttle Orbiter scheduled for flight in 1980, will undergo its first major simulated "flight," all systems test, on or about December 15, 1979, at the NASA Kennedy Space Center in Florida. Astronauts and ground support teams will put the vehicle through an around-the-clock five day critical operational test.

Among the tests to be performed during the 140-hour test are five separate launch and ascent flight profiles, on-orbit operations and one entry phase. Several hundred NASA and contractor aerospace engineers will take part in this Orbiter Integrated Test. Test teams at the Kennedy Launch Center, the NASA Johnson Space Center, Houston, Texas and Rockwell International Space Division, Downey, California, will monitor the test activities.

The Orbiter Integrated Test is one of the final verifications of Orbiter systems and electronics before the "Columbia" is cleared for final assembly with external tank and solid rocket boosters. The first launch is planned for June 30, 1980.

- more -

Test objectives include the demonstration of selected Orbiter hardware and software (computer programs) subsystem operations during a mission timeline. In addition to nominal launch conditions, the test will put the astronauts and ground support teams through various flight anomalies. The test is also designed to demonstrate the ability to switch from the primary to back-up flight control systems, the ability of ground support systems to support an Orbiter countdown and capability of the interface between the Orbiter onboard software and the Mission Control Center.

Astronauts John W. Young and Robert Crippen, prime crew for the first flight and backup crew members Joe Engle and Richard Truly will take part in the test. The prime crew and the backup crew will alternate in the Orbiter crew compartment throughout all phases of the 140-hour test.

The test will take place in the Orbiter Processing Facility at the Kennedy Space Center. The vehicle will be resting on its landing gear throughout the test. Power for the test will be furnished by the vehicle's electrical fuel cells or ground support via an umbilical. Launch sequences of ignition of the three Shuttle main engines and the two solid rocket boosters, which provide the 6.9 million lbs. of thrust necessary to place the spacecraft in orbit, will be simulated.

The test is divided into five runs with the first day devoted to buildup and checkout of vehicle and ground systems. Astronaut

- more -

crew members will be in the cockpit through all phases and on the second day the crew will wear pressure suits through the operation which includes a nominal launch and entry. The crew will be transferred from the crew quarters and enter the vehicle as they would on launch day.

The first launch sequence will be normal, but ensuing launches will include various modes which would conceivably require a mission abort, return to launch site or an emergency landing at a designated landing strip.

Flight controllers at the Mission Control Center's (MCC) Operation's Control Room at Houston, will monitor displays during the tests. Key parameters of systems performance will be observed by controllers who will later be on the scene during the actual launch and flight of the Shuttle.

Engineers in the Mission Evaluation Room in a building adjacent to the MCC will monitor similar display and voice loops. Their job will be to monitor data of selective portions and procedures of the test. It is their job to develop solutions to test problems if and when they occur.

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NASA News

National Aeronautics and
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Lyn Cywanowicz

RELEASE NO: 79-74

For Release

December 11, 1979

NASA RECEIVES 3278 APPLICATIONS FOR ASTRONAUT PROGRAM

The National Aeronautics and Space Administration has received 3278 applications for Space Shuttle astronaut candidate in a recruiting drive that ended December 1. A total 2937 men and women applied for the 10 to 20 open astronaut positions, with 341 of these applying for both pilot and mission specialist categories.

The mission specialist category had 2,759 applicants and the pilot category had 488 applicants.

The number of women applicants for the two categories total 390.

The astronaut selection board at the Johnson Space Center is narrowing the selection to those best qualified in the two categories. From these, approximately 100 will be selected for preliminary screening and physicals at JSC in the spring of 1980.

Those selected as astronaut candidates will report to JSC in July 1980 for their one-year training and evaluation period. Final selection as an astronaut will depend on satisfactory completion of the evaluation period.

- more -

Pay for civilian candidates will be based on the Federal Government's General Schedule for pay scale from grades GS-11 through GS-14, with approximate salaries from \$20,611 to \$34,714 per year.

Military candidates will be assigned to JSC but will remain in active military status for pay, benefits, leave and other military matters.

NASA plans to accept applications for Space Shuttle astronauts on an annual basis. The number of open positions will depend on NASA's need for pilots and mission specialists.

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NASA News

National Aeronautics and
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Lyn Cywanowicz

For Release

RELEASE NO: 80-009

February 27, 1980

NASA SYMPOSIUM '80 TO BE HELD AT KELLY AIR FORCE BASE

NASA's Aerospace Symposium '80 will be held March 12-14 at Kelly Air Force Base, San Antonio, Texas.

The symposium is designed to motivate students--especially females and minorities--to seek careers in science and engineering.

More than 220 students, teachers and counselors will participate in the three days of seminars and workshops. A tour of Kelly Air Force Base is also planned.

Seminars will be conducted by NASA scientists and engineers. Topics of the seminars include: Exploring the Outer Planets; Astronomy; Benefits from Space Medicine; Space Shuttle Program; Solar Power; and Future Space Systems.

NASA astronauts Frederick D. Gregory, Terry J. Hart and Judith A. Resnik will present awards to students who submitted outstanding science papers prior to the symposium. The papers are being judged by Johnson Space Center scientists and engineers.

Symposium activities will take place in Hangar 1610 from 9:30 a.m. to 2:45 p.m. each day.

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Note to Editors

For additional information contact A. D. McCall at (512) 925-7951 in San Antonio, Texas.

NASA News

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Terry White

RELEASE NO: 80-010

For Release

Immediate

LUNAR AND PLANETARY CONFERENCE WILL BE MARCH 17-21 IN HOUSTON

More than 700 scientists from all parts of the world are expected to attend the 11th annual Lunar and Planetary Science Conference next month at NASA's Johnson Space Center in Houston.

The weeklong conference, beginning Monday, March 17, is being hosted jointly by the Johnson center and the Lunar and Planetary Institute of Houston.

Focusing on the Year of the Planets, the conference will center around recent results from a variety of planetary encounters in 1978-79, as well as new information on the Moon, Mars and meteorites.

The sessions will include:

- * Reports on recent results from the moons of Jupiter obtained by Voyager spacecraft.
- * New data on Venus from the Pioneer Venus spacecraft.
- * Recent analysis of Viking orbiter and lander data still being sent back from Mars.
- * Details of the analysis of meteorites recently collected in large numbers from Antarctica.

New theoretical, experimental and analytical studies of the Moon, based on lunar sample analyses and on continued Apollo data analysis, will be the topics of several conference sessions. Detailed models of the Moon's interior structure and composition are being developed for comparison to Earth and other planets.

Two groups of lunar samples are being given special attention at this year's conference: complex fragmental rock (breccias) from the light-colored lunar highlands are being examined to understand the early history of the Moon and the Earth. Long cores of "lunar soil," the powdery rubble that covers the mare's surface, are being carefully dissected to trace the history of the Sun -- a history written by tiny atomic particles from the Sun that have been trapped in the lunar soil for millions of years.

One evening will be devoted to lectures of general interest. Topics will include Mars, Venus, Jupiter's moons, Antarctic meteorites and the United Nations treaty dealing with utilizing the Moon and planets. Results of applying satellite remote-sensing techniques to geological studies of the Earth will be another evening's special session.

"Poster sessions" in which authors of papers will use graphic displays to discuss their work informally during breaks in the schedule will be featured for the first time. The posters will be displayed in the Recreation Center gymnasium.

The conferences begun in 1970, were originally used to share the knowledge gained from the lunar samples returned by the Apollo missions.

The first six Lunar Science Conferences were almost entirely devoted to lunar studies. More recently, lunar research has become increasingly important for helping to understand the other planets of the solar system, and the last three conferences included much more information about comparative studies of such other bodies as Mercury, Venus, Mars and the asteroids. The name of the conference has been changed to "Lunar and Planetary" to reflect the continuing trend for combined studies in planetary exploration.

Concurrent sessions will be held in the Johnson Center's main auditorium and in two halls at the Gilruth Recreation Center. Conference cochairmen are Dr. Michael Duke, Chief of Johnson's Planetary and Earth Sciences Division, and Dr. Roger J. Phillips, director of the Lunar and Planetary Institute.

- end -

NOTE TO EDITORS

Reporters and science editors planning to cover the Conference should register at the Gilruth Recreation Center prior to the opening session at 9 a.m. March 17. Out-of-town newsmen are urged to make reservations for JSC-area motels as soon as possible. For further information, call the JSC Public Information Office, 713-483-5111.

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X

Kay Ebeling

RELEASE NO: 80-011

For Release
March 3, 1980

NASA DEVELOPS SYSTEM FOR HEAT TREATMENT OF CANCER

Cancer research has shown that heat treatments can destroy cancer cells without harm to adjacent healthy tissue. Methods for producing heat have grown steadily in sophistication--starting in 1893 when doctors induced fever in cancer patients to today's techniques such as ultrasound, radiated microwave, and blood perfusion.

In mid-1978 the NASA Johnson Space Center signed a memorandum of understanding with the Stehlin Foundation for Cancer Research at St. Joseph's Hospital in Houston, saying the space center will provide technical support for the foundation's work with heat, or hyperthermia, treatment of cancer.

Tumors will heat faster than healthy tissue perhaps because they hold more fluid to contain the heat, and fewer blood cells to carry the heat away. Tumors have restricted blood flow. Heat concentrated on a cancerous area can destroy cancer cells without harming healthy tissue nearby.

The challenge for JSC engineers was to improve radio frequency (RF) heating techniques being used at the Stehlin Foundation. First step was to develop a machine for treatment of small animals.

- more -

Then after a year of tests on mice, JSC scientists developed an advanced RF hyperthermia system for treatment of humans.

"The human RF system has performed successfully on several cancer patients," said Kumar Krishen of JSC's Experiment Systems Division. Krishen is technical coordinator of the project. "Developing the advanced human RF hyperthermia system involved acute concerns about safe and reliable performance."

For work on the machine to be used on humans, Krishen's team called for assistance from JSC's safety and reliability specialists who reviewed the overall design and performance of the equipment.

In January 1980 the team delivered an experimental human treatment system to St. Joseph's hospital.

"The RF system for human treatment uses a gradual buildup of power to its preselected value," Krishen said. "Two pairs of sequentially driven electrodes provide more concentration of RF power at the tumor and disperse heat at the skin."

The team also developed a feedback control which allows regulation of temperatures within a specific area to an accuracy of 0.2° C.

One area of concern was heating of the skin below the electrodes which in some cases causes burns. "Our approach was to circulate temperature-controlled water through metal tubing soldered onto the back of flexible electrodes," Krishen said. "This scheme has been found to be very useful."

A data printer added to the system records temperatures and power levels as a function of time.

"The small animal experimental system we first designed yielded very valuable data," Dr. Krishen said. After trying different combinations, the ESD team came up with an optimum size and shape for the applicator. They determined the maximum heat the animal's body could tolerate, 41°C , and gave the applicator a convex shape to keep "hot spots" from coming into contact with the skin.

"A notable feature of the small animal system is the ability to apply up to 50 watts at five frequencies from three MHz to 30," Dr. Krishen said. "This helps us to indicate the advantages, if there are any, of treating various cancer types at a specific frequency."

The small animal system is used currently to establish human protocols and to study the effects of hyperthermia at the cell level.

"The challenge now is to deliver the heat with minimized side effects," Dr. Krishen said. "We are investigating the possibility of transmitting the radio waves through the patient with electrodes that do not come in contact with the skin. They will function somewhat like antennae."

This assignment was a particular challenge for Krishen and his co-workers, since their specialty is observing the Earth's weather, soil conditions, and agriculture using microwave data from aircraft and satellites.

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Kay Ebeling

RELEASE NO: 80-016

For Release

March 20, 1980

LABORATORY AT JOHNSON SPACE CENTER

TESTS AND RE-TESTS SHUTTLE AVIONICS SYSTEM

It is two minutes into a Space Shuttle flight. Onboard computers activate pyrotechnic devices and the solid rocket boosters separate from the Orbiter. They descend to altitudes where a drogue chute and a parachute control their descent into the ocean.

However, almost immediately after separation, the crew observes that the Space Shuttle main engine three status light is RED. There is a problem. The crew also observes the main propulsion system pressure for engine three is rapidly decreasing to 0 percent. With an engine failure at this time, the Orbiter cannot achieve orbital velocity.

The crew selects the return-to-launch-site abort mode, and the Orbiter returns to Kennedy Space Center.

The mission described above actually took place at Johnson Space Center in the Shuttle Avionics Integration Lab. It was one of a series of tests that will be run before launch of the Space Shuttle later this year. Persons operating the equipment know it was just a simulation,

- more -

but as far as the flight computers in the lab are concerned, it was a real spaceflight.

Equations for the aerodynamics, environment, and motion of the Orbiter, SRB, and ET separations were fed into the test system by the Shuttle Dynamic Simulator.

The SAIL is a high-fidelity mockup of all the wiring and electronics that make up the Space Shuttle system. It uses flight qualified hardware to run through phases of a mission, testing the full electrical systems of the Space Shuttle.

The SAIL looks like a full-sized Orbiter stripped of its skin with its wires and connectors bared. It is configured with the same electrical systems as are on the "real" Orbiter in Florida.

On a 24-hour basis SAIL employees run troubleshooting sequences, verifying procedures for the Shuttle's complex avionics system. Over 300 mock missions will fly in the lab at JSC before the projected November launch of the first Shuttle mission.

Some of the avionics the SAIL verifies are displays and controls; power and control; solid rocket booster control; guidance, navigation, and control; data processing; operational flight instrumentation; communications and tracking; and external tank propellant control and instrumentation.

A typical test series begins with an initial run with all systems operating normally--a "nominal" mission phase in space parlance. Then in the following runs, test engineers inject various failures into the flight system to see if it can cope with the problems. If discrepancies

result, they are isolated to hardware, flight computer software, or crew procedures. Subsequently, Orbiter engineers and technicians make appropriate fixes to the real Shuttle vehicle which is to fly.

The current test schedule has the SAIL running ascent (launch) verifications through June, ascent/on-orbit verifications through July, then atmospheric entry and final mission compatibility testing up to date of launch. The ascent mode tests are particularly complex as they include launch, SRB separation, ET separation, and insertion into orbit.

An ascent troubleshooting sequence can cover, for example, navigation performance, computer synchronization, control system performance, and an abort-return-to-launch site due to engine failures.

The SAIL also provides direct support in two ways to the real vehicle at Kennedy Space Center as it proceeds through its checkout at the Cape. First, critical ground checkout programs from the system at KSC are brought to SAIL and tested in advance using the actual procedures from KSC and the actual launch processing system equipment at JSC. In this way the SAIL verifies that the programs and equipment are ready for first use in the real Shuttle vehicle.

Second, the SAIL receives live Shuttle data from KSC during a checkout at the Cape over a satellite data link provided specifically for that purpose. Any troubles encountered can then be evaluated immediately and, if necessary, duplicated in the SAIL facility for assistance in their resolution. This saves valuable checkout time at KSC.

After each run the flight computers, the laboratory computers, the Shuttle dynamic simulator computers, and the launch processing system computers, as required, dump their memory contents onto tape for test engineers to study.

For all the flight computers know, it was a real mission.

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NOTE TO EDITORS:

The following photos illustrate this release. Members of the news media can obtain prints or transparencies free of charge by contacting the Photo Distribution Office, Johnson Space Center, at AC 713/483-4231.

S79-37403	Photo of a painting of the SAIL
S79-32339	Cockpit during lighting test (reproduces in color only)
S79-34714	Overhead aft view of payload bay and work tables
S79-34719	Same as 714 from floor level
S79-34728 & 29	Closeup of forward and aft bay wiring configuration
S79-34716	Overall view of test station; outside view of cockpit
S78-27463	Test station hardware racks
S79-34723	Overall view of test stations during a run
S79-39162	Astronaut John Creighton at the cockpit

NASA News

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Kay Ebeling

For Release

Release No: 80-22

Upon Receipt

Also Released At NASA Headquarters

NASA SATELLITE TO AID TIMBER INDUSTRY IN MANAGING FOREST LANDS

An Earth resources NASA satellite has found a new use:
gathering data to improve management of America's forest lands.

The project reflects a unique relationship between the government agency and the private sector; one in which the initiating company is sharing the total cost but the technology developed will be available to all other timber companies.

The satellite is Landsat-3. The company is the St. Regis Paper Co., New York.

Since 1977, St. Regis has been working with NASA in a test program to see if Landsat data could improve the paper industry's information base on forest lands. St. Regis wants to use the data for planning timber harvests, leasing and buying new timber lands, and to monitor more than 920,000

more

hectares (2.3 million acres) across the South.

The project has been so successful that the St. Regis Southern Timberland Div., Jacksonville, Fla., recently authorized over \$300,000 of new capital investment for a forest resource information system to use Landsat data to supplement conventionally acquired data in its general operations.

The entire forestry industry stands to gain from the venture because technology developed by the St. Regis experiment is in the public domain and available to other companies. The company and NASA plan to conduct a symposium in 1981 to demonstrate Landsat interpretation methods to timber industry managers.

St. Regis was the first private company to act as a user in NASA's Resource Observation Applications Test Program. The project established a unique relationship between NASA and the private sector for St. Regis initiated the project--rather than NASA--and the company is sharing in the total cost.

St. Regis will use techniques developed in the project at its Dallas computer facility to process the data coming from Landsat which will complement the automated data base at the St. Regis divisional remote sensing center in Jacksonville. This combined data will assist the company in estimating timber volume and productivity, as well as changes in the

conditions of the forests.

Landsat data will be used to determine distribution of the major types of trees on St. Regis-owned timberland in Texas, Florida, Georgia, Alabama, Mississippi, and Louisiana and other land available through lease or purchase.

The project is being conducted by NASA's Johnson Space Center, Houston; the Laboratory for Applications of Remote Sensing at Purdue University in Lafayette, Ind.; and the St. Regis Paper Co. It is scheduled to end in September of this year.

Landsat-3 orbits the globe 14 times a day at an altitude of 900 kilometers (560 miles). Its electronic multispectral scanner returns data which is processed into film and computer tape format. This resource information may be used to characterize different types of terrain, vegetation, soils, rocks, and other surface features.

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Note to Editors:

Quarterly reports on the Applications Pilot Test Program are available for review at the NASA Scientific and Technical Information Facility, P.O. Box 8767, Baltimore/Washington International Airport, Md. 21240
Phone: 202/621-1910

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Kay Ebeling

For Release

RELEASE NO: 80-028

Upon Receipt

VISITORS TO JOHNSON SPACE CENTER CAN

WALK THROUGH NEW SPACE SHUTTLE CARGO BAY DISPLAY

A new display at Johnson Space Center will allow visitors to walk through a fullscale Space Shuttle cargo bay, see and touch replicas of Space Shuttle equipment, and in the future watch real-time video transmissions from onboard cameras during space missions.

The 15-by-50 foot payload bay display opened for the public Saturday, April 26. The exhibit was a main attraction at the 1979 Paris Air Show after which it was dismantled and shipped to JSC to become a permanent part of the visitor program. It now sits at the south end of the Visitor Center (Building 2).

Visitors can enter the mockup (shortened 10 feet for installation) by a ramp, then walk through the Orbiter's payload bay. Cargo in the exhibit will change with each mission of the Space Shuttle: the cargo on display today is a model of Spacelab, the European Space Agency's pressurized laboratory which will be carried onboard the Shuttle in the 1980's. Planned for the near future as cargo is a model of a commercial satellite ready to be deployed into space.

Visitors will walk through the payload bay and out onto a pallet where experiments are exposed to the environment of space. They will then walk back to "Earth" via a ramp at the rear of the space ship.

A mannequin astronaut hovers just outside the model in a full spacesuit and jet backpack, demonstrating crew work outside the Orbiter. On display in the future will be a replica of the remote maneuvering arm, or space crane, that will be used on the Shuttle to deploy and retrieve satellites in space.

"With this exhibit people will be able to get the effect and relate to the size of the Shuttle's cargo-carrying capacity," Chuck Biggs, chief of the Public Services at JSC, said.

Until the first Space Shuttle mission, tapes of flight simulations will play inside the exhibit. Later, live TV of each mission as it takes place will be patched into the exhibit.

Displays continue to change at the space center. In the past year, Building 9A, containing a full-sized Orbiter mockup used for astronaut training, and Building 31, with Apollo program moon rocks on display, opened to the public.

The Center is open for visitors from 9 a.m. to 4 p.m. every day except Christmas. JSC is about 20 miles southeast of downtown Houston.

For additional information about these exhibits or tours at the Center, call 713/483-4241.

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April 30, 1980

NASA-JSC

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Man 1

Terry White

For Release

RELEASE NO: 80-029

May 1, 1980

NASA CONTRACTS DRAPER LAB FOR SHUTTLE AVIONICS SOFTWARE

The NASA Johnson Space Center has signed a cost-plus-fixed-fee contract with the Charles Stark Draper Laboratory, Inc., of Cambridge, Massachusetts for development of Shuttle Orbiter avionics software.

Valued at \$12,931,464, the non-competitive contract has a 21-month duration starting April 29. The Draper Laboratory will perform the bulk of the work at Cambridge, with some at Rockwell International Space Division, Downey, California and at Johnson Space Center.

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National Aeronautics and
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May 1

David Garrett
Robert Gordon

For Release

1 P.M., Thursday
May 1, 1980

Release No: 80-030

SHUTTLE COLUMBIA'S FLIGHT ENGINES TO BE RETESTED

The three Space Shuttle main engines designated for the first flight of the orbiter Columbia will be tested again to assure operational readiness for the flight.

The engines, acceptance tested between April and July 1979, will be shipped from the Kennedy Space Center, Fla., to the NASA testing facility in Mississippi for reacceptance firings.

The testing will take two to three months and is expected to have no effect on the timing of the Space Shuttle's first flight, now anticipated between November 1980 and March 1981.

-more-

The decision to retest the engines was based on the number of modifications that have been made during the past year. These modifications concerned high pressure turbopumps, valves and nozzles.

Each engine will be operated on the test stands at the National Space Technology Laboratories, Bay St. Louis, Miss. After the tests, the engines will be returned to Kennedy for installation in the Columbia.

About six weeks before the first flight, the engines will be fired once again, for 20 seconds, on the launch pad.

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NASA News

National Aeronautics and
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Robert Gordon

For Release

RELEASE NO: 80-032

May 9, 1980

SPACE SOLAR CELL CONTRACT

NASA has selected two California-based aerospace firms for negotiations leading toward contracts on the production of solar cells planned for use aboard a supplemental power source for the Shuttle Orbiter.

The two firms are Applied Solar Energy Corp., City of Industry, California, and Spectrolab, Sylmar, California. Each firm will receive a \$300,000 contract to develop a low cost, large area solar cell which can be used in NASA's proposed Power Extension Package. The contract also calls for the contractors to develop the production, testing and qualification capabilities and or potential necessary to meet the production requirements of about 144,000 space qualified solar cells during a 12-month period.

- more -

NASA's goal in this contract effort is to reduce the production cost of space solar cells to \$30 per watt. Current space solar cells cost \$80-\$120. Solar cell requirements for the power extension power represent a significant percentage of the total power extension program cost which means that a low cost, mass produced solar cell is required.

The power extension program is designed as a 2,000 pound package that can be folded into the Shuttle Orbiter's cargo bay. When in orbit an astronaut would use the Orbiter's 50-foot long remote mechanical arm to move the power package and place it in space in front of the Orbiter. Then, by command, the packages' two 177-foot long wings will be unfolded. The wings are about 12 feet wide and will be covered with the new low cost solar cells which convert the sun's energy into electrical power.

The power package will be able to furnish 26 kilowatts of electrical power for Shuttle use. The Orbiter's primary source of electrical power comes from three on-board fuel cells which produce up to 21 kilowatts. The added power of the extension package will augment experiments and other activities which require more power than can be produced by the Orbiter fuel cells.

At the end of a mission the extension package would be retrieved and loaded in the cargo bay for use on subsequent flights.

The contracts comprise the first of two phases, the second being the actual production effort of 12,000 cells per month over a years period.

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NASA News

National Aeronautics and
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Lyn Cywanowicz

For Release

RELEASE NO: 80-033

Upon Receipt

FEDERAL WOMEN'S PROGRAM WEEK, MAY 13-16

"Discovery" this year's theme for JSC's Federal Women's Program Week, concentrates on men and women working together and the conflicts both face with women subordinates, peers and supervisors.

Venita Van Caspel, is featured as the keynote speaker at the opening day luncheon, May 13. Van Caspel is president of Van Caspel & Company, Inc., Stockbrokers in Houston. She is also a Certified Financial Planner, author, TV personality and community leader.

Other featured speakers include: Jere E. Talley, Project Director, Recruitment and Training Program, Inc.; Von Nash, President, Von Nash Co.; Sue Burnett, General Manager, Burnett Personnel Consultants; Dr. Dale Hill, Psychotherapist, Houston, Texas; Jan Segerstrom, President, Triad Interests, Inc.; and Robert Horton, Houston Clean City Commission.

Activities for the program will be held at the Gilruth Recreation Center and the public is invited to attend.

For additional information contact Elsie Easley at 483-4311.

- more -

Schedule of FWP Activities

Tuesday, May 13, 1980

- 11:30 Luncheon, Gilruth Recreation Center, large banquet room
Welcome - Christopher C. Kraft
Introduction of Keynote Speaker - Virginia Gibson
Keynote Speaker - Venita Van Caspel, President,
Van Caspel & Co., Inc., Stockbrokers, Houston,
Texas
Award Presentation - Virginia Hughes

Wednesday, May 14, 1980

- 9:00 Program on Interviewing (Interviewer/Interviewee) -
Jere E. Talley, Project Director, Recruitment and
Training Program, Inc., Women's Employment Division,
Houston, Texas
11:30 Film - What You Are Isn't Necessarily What You Will
Be - Dr. Morris Massey
1:00 Turning On Your Own Key - Von Nash, President, Von
Nash Co., Austin, Texas

Thursday, May 15, 1980

- 9:00 Women Are Not Special - Sue Burnett, General Manager,
Burnett Personnel Consultants, Houston, Texas
12:30 Pleasure and Pain of Competing - Dr. Dale Hill,
Psychotherapist, Houston, Texas

Friday, May 16, 1980

- 9:00 Discover Yourself - Jan Segerstrom, President, Triad
Interests, Inc., Houston, Texas
1:00 Putting It All Together - Robert Horton, Houston Clean
City Commission, Houston, Texas

NASA News

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Robert Gordon

For Release

RELEASE NO: 80-034

May 12, 1980

COMPLEX SIM TESTS RMS

Parts of the remote manipulator system, the first space robot-like crane which will handle inflight transfer of Space Shuttle cargo, are currently undergoing testing in one of the most complex simulations conducted at NASA's Johnson Space Center.

The remote manipulator system (RMS) is an intricate machine being developed for NASA by the National Research Council of Canada. It is planned for use aboard the Shuttle Orbiter, beginning with the second flight. The manipulator system will be used for a number of tasks including placing or retrieving satellites in space, assembly of structures or components, and if necessary the rescue of crews from an inoperative vehicle. The manipulator would transfer the crew from a disabled vehicle to the rescue vehicle.

- more -

Spar Aerospace Products, Ltd., is under contract to the Canadian government to design, build and test the manipulator system. NASA recently signed a \$63.6 million contract for the production and delivery of three additional manipulator systems. The first flight item, scheduled for delivery to the Kennedy Space Center, Florida, later this year, was built by the Canadians at no cost to NASA.

The system consists primarily of a 50-foot long arm with movable joints at the shoulder, elbow, and wrist, plus associated motors, gears, sensors, and an end effector which serves as the arm's ingenious hand. Also included in the system are cockpit controls and displays and electronics which control the arm and provide an interface with the Orbiter flight computers.

The test at JSC, which began several weeks ago, involves four separate flight-type parts of the system. These are coupled with the Orbiter flight computer with corresponding flight software, or programming, in the Shuttle Avionics Integration Laboratory (Building 16). The laboratory is an engineering tool for development, checkout, and verification of flight systems long before the flight hardware is flown in space.

The parts being tested, which were recently delivered from Canada, are the display and control panel, rotational and translational hand controllers and the manipulator controller interface unit. The interface unit is part of the electrical subsystem which operates the manipulator. The arm and its movement is simulated by laboratory computers.

- more -

Jon H. Brown, special assistant in the Shuttle Avionics Integration Division at JSC, said these RMS pre-acceptance tests (R-pat for short) are designed to complement the Canadian acceptance tests of the remote manipulator system scheduled for use on the second Shuttle flight. In addition, the tests provide an opportunity to check laboratory systems in advance of the formal verification tests scheduled later in the year.

Astronauts, NASA and contractor engineers and technicians and representatives of Spar and the Canadian Research Council are attempting to duplicate events and circumstances astronauts would face operating the space crane in orbit. These computer simulations can both predict and mimic, with amazing fidelity, the realities of spaceflight.

Astronauts Sally Ride, Judy Resnick, Dr. Story Musgrave, and Dr. Norm Thagard are actually controlling the arm's movement by using the rotational or translational hand controllers in a mockup of the Orbiter aft station. Operators of the system manipulate the controls while looking at a computer-generated television scene which duplicates the view the crew would have out the aft window of the cockpit.

Brown explained that one of the difficulties astronauts will face in operating the mechanical arm is the dynamics induced by movement of the arm. In the weightlessness of space once a mass is set in motion (the arm and attached payload), it will keep going until it is stopped by an equal and opposite force.

- more -

As a result each time the arm is commanded to move, the control system must eventually deliver a command to counteract this motion. Reactions from the arm movement cause the Orbiter to move, and vice versa.

Possible interaction of the arm's control system with that of the Orbiter is an area which must be fully explored prior to flight. The laboratory simulation required to perform this investigation is among the most sophisticated ever attempted at JSC.

As in all manned space simulations numerous problems are fed into the system. The manipulator sims are no different.

According to Brown, ample problem situations as well as normal operations are built into the sims. "It is extremely complex," Brown said.

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NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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Lyn Cywanowicz

For Release

RELEASE NO: 80-035

May 13, 1980

BARRIOS SELECTED FOR CONTRACT NEGOTIATIONS

The NASA Johnson Space Center, Houston, Texas, has selected Barrios and Associates of Dickinson, Texas, for negotiations leading to the award of a cost-plus-award-fee contract. The contract covers flight design support services for operational flights of the Shuttle Transportation System.

The initial two years of the planned five-year program will run from June 1, 1980 through May 1982, at a cost of \$1.9 million.

Other bidders were: Jefferson Assoc., Houston, Texas; Nelson and Johnson Engineering, Boulder, Colorado; Chimex Systems, Houston Texas; and OAO Corp., Beltsville, Maryland.

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NASA News

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Bob Gordon

For Release

RELEASE NO: 80-037

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

ORBITAL FLIGHT TEST PROGRAM EXTENDED

NASA has extended the date for completion of the first four Space Shuttle orbital flight tests to April 1982. The extension of the flight test program has made it necessary to reschedule the first operational flight of the Columbia, STS-5, from March 1982 to September 1982.

The decision to extend the flight test program and reschedule STS-5 is the result of several factors, the major being continuing engineering assessment and improvement of the Thermal Protection System.

Additionally, it is felt that there should be more time allowed for necessary engineering tasks during the orbital flight tests, and that a concerted effort should be made to effect a smooth and structured transition from the orbital flight tests to the operational phase of the Space Shuttle Program.

- more -

The first operational flight will launch the Tracking and Data Relay Satellite-A (TDRS-A) into a geosynchronous orbit according to the Space Transportation System operations manifest currently being revised.

The operational launch schedule, reflecting the extended test program adjustment will be discussed in detail with Shuttle users at a conference to be held May 29 and 30 at Kennedy Space Center, Florida.

Changes in the operations manifest have been coordinated with the Department of Defense, a major user of the Space Shuttle.

During the transition to full Space Shuttle operations, NASA will employ the Delta 3910 and the uprated Delta 3920 launch vehicles. In addition to NASA, other organizations expected to use these launch vehicles include Telesat of Canada, Indonesia and Hughes Aircraft.

To provide timely launches and to accommodate 3900-series Deltas for these and other Delta users, modification of Launch Complex 17-B at the Kennedy Space Center is being considered.

March 1981 is now the most probable time for first launch of the Space Shuttle (STS-1). The completion of the Thermal Protection System and its mechanical integrity remain the prime technical concern of the Shuttle development program.

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May 27, 1980

NASA News

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
AC 713 483-5111

Terry White

For Release

RELEASE NO: 80-038

May 29, 1980
10 a.m. CDT

NASA SELECTS 19 ASTRONAUT CANDIDATES

The National Aeronautics and Space Administration today announced the selection of 19 new astronaut candidates for the Space Shuttle Program. The new group of candidates will report to the Johnson Space Center July 7, 1980, to begin a one-year training and evaluation program.

Of the 19 selected, eight are pilot candidates and 11 are mission specialist candidates. Two of the mission specialist candidates are women. One pilot candidate is black and one mission specialist is Hispanic. The new group of candidates includes William F. Fisher, the husband of Anna Fisher, who was selected for the astronaut candidate program in 1978. Six civilians, including three current employees of the Johnson Space Center, and 13 military candidates were selected.

- more -

NASA received 2880 applications for mission specialist positions and 585 for pilot positions. Of these, 121 finalists were interviewed and given detailed medical evaluations at NASA's Johnson Space Center, Houston, Texas.

After one year of training and evaluation at the Johnson Space Center, successful candidates will become astronauts and enter the Shuttle training program leading to selection for Shuttle flight crews.

Pilots will operate the Space Shuttle Orbiter, maneuvering it in Earth orbit and flying it to Earth for a runway landing.

Mission specialist astronauts will have the overall responsibility for the coordination, with the commander and pilot, of Space Shuttle operations in the areas of crew activity planning, consumables usage, and other Space Shuttle activities affecting experiment operations. They may participate in extravehicular activities (space walks), perform special payload handling or maintenance operations using the Space Shuttle remote manipulator system, and assist in specific experiment operation at the discretion of the experiment sponsor.

A list of the new astronaut candidates is attached.

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ASTRONAUT CANDIDATES

James P. Baglan	Civilian	Mission Specialist
LT COL John E. Blaha	US Air Force	Pilot
Major Charles F. Bolden, Jr.	US Marine Corps	Pilot
LT COL Roy D. Bridges, Jr.	US Air Force	Pilot
Franklin R. Chang	Civilian	Mission Specialist
Mary L. Cleave	Civilian	Mission Specialist
Bonnie J. Dunbar	Civilian	Mission Specialist
William F. Fisher	Civilian	Mission Specialist
Major Guy S. Gardner	US Air Force	Pilot
Major Ronald J. Grabe	US Air Force	Pilot
Capt. David C. Hilmers	US Marine Corps	Mission Specialist
LT David C. Leestma	US Navy	Mission Specialist
John M. Lounge	Civilian	Mission Specialist
Major Bryan D. O'Connor	US Marine Corps	Pilot
LCDR Richard N. Richards	US Navy	Pilot
Capt. Jerry L. Ross	US Air Force	Mission Specialist
LCDR Michael J. Smith	US Navy	Pilot
Major Sherwood C. Spring	US Army	Mission Specialist
Major Robert C. Springer	US Marine Corps	Mission Specialist

NAME: James P. Bagian, M.D.

BIRTH DATE AND PLACE: 2-22-52 - Philadelphia, Pennsylvania

CURRENT RESIDENCE: Philadelphia, Pennsylvania

EDUCATION: Central High School - Philadelphia, Pennsylvania
BS, Mechanical Engineering, Drexel University, 1973
MD, Medicine, Thomas Jefferson University, 1977

PRESENT POSITION: Anesthesiology Resident
Hospital of the University of Pennsylvania
Philadelphia, PA

(Currently on leave of absence from the Medical
Sciences Division of the NASA Johnson Space Center)

PARENTS: Mr. & Mrs. Philip Bagian of Philadelphia, Pennsylvania

*folks
address*

NAME: Franklin R. Chang, PhD.

BIRTH DATE AND PLACE: 4-5-50 - San Jose, Costa Rica

CURRENT RESIDENCE: Jamaica Plain, Massachusetts

EDUCATION: Hartford Public High School, West Hartford, Connecticut
BS, Mechanical Engineering, University of Connecticut, 1973
PhD, Physics, Massachusetts Institute of Technology, 1977

PRESENT POSITION: Physicist
The Charles Stark Draper Lab, Inc.
555 Technology Sq.
Cambridge, MA 02139

PARENTS: Mr. & Mrs. Ramon A. Chang of Escazu, Costa Rica

NAME: Mary L. Cleave, PhD.

BIRTH DATE AND PLACE: 2-5-47 - Southampton, New York

CURRENT RESIDENCE: Wellsville, Utah

EDUCATION: Great Neck North Senior High School, Great Neck, New York
BS, Biology, Colorado State University, 1969
MS, Botany, Utah State University, 1975
PhD, Civil Engineering, Utah State University, 1979

PRESENT POSITION: Graduate Research Engineer
Utah Water Research Laboratory
Utah State University, UMC 82
Logan, UT 84322

PARENTS: Mr. & Mrs. Howard E. Cleave of Williamstown, Massachusetts

NAME: Bonnie J. Dunbar

BIRTH DATE AND PLACE: 3-3-49 - Sunnyside, Washington

CURRENT RESIDENCE: Seabrook, Texas

EDUCATION: Sunnyside High School, Sunnyside, Washington
BS, Ceramic Engineering, University of Washington, 1971
MS, Ceramic Engineering, University of Washington, 1975

PRESENT POSITION: Flight Controller/Payload Officer
Payload Operations Division
Johnson Space Center
Houston, Texas 77058

PARENTS: Mr. & Mrs. Robert C. Dunbar of Outlook, Washington

NAME: William F. Fisher, M.D.

BIRTH DATE AND PLACE: 4-1-46 - Dallas, Texas

CURRENT RESIDENCE: Seabrook, Texas

EDUCATION: North Syracuse Central High School, North Syracuse, New York
BS, Psychology, Stanford University, 1969
MS, Engineering Science, University of Houston, 1980
MD, Medicine, University of Florida College of Medicine, 1975

PRESENT POSITION: Emergency Physician
Emergency Department Physicians' Medical Group, Inc.
4640 Admiralty Way, #508
Marina Del Rey, CA 90291

PARENTS: Mr. & Mrs. Russell F. Fisher of Winter Park, Florida

NAME: David C. Hilmers, CAPT, US Marine Corps

BIRTH DATE AND PLACE: 1-28-50 - Clinton, Iowa

CURRENT RESIDENCE: Iwakuni, Japan

EDUCATION: Central Community High School, Dewitt, Iowa
BS, Math, Cornell College, 1972
MS, Electrical Engineering, Naval Postgraduate School, 1978

PRESENT POSITION: Officer in Charge
Sub-Unit 2, Marine Wing Headquarters Squadron One,
First Marine Aircraft Wing
MCAS, Iwakuni, Japan

PARENTS: Mr. & Mrs. Paul C. Hilmers of Dewitt, Iowa

NAME: David C. Leestma, LT CMDR, US Navy

BIRTH DATE AND PLACE: 5-6-49 - Muskegon, Michigan

CURRENT RESIDENCE: Camarillo, California

EDUCATION: Tustin High School, Tustin, California
BS, Aero. Engineering, US Naval Academy, 1971
MS, Aero. Engineering, Naval Postgraduate School, 1972

PRESENT POSITION: Operational Test Director
U.S. Navy Air Test & Evaluation Squadron
Pt. Mugu, CA 93042

PARENTS: Mr. & Mrs. Harold F. Leestma of El Toro, California

NAME: John M. Lounge

BIRTH DATE AND PLACE: 6-28-46 - Denver, Colorado

CURRENT RESIDENCE: Friendswood, Texas

EDUCATION: Burlington High School - Burlington, Colorado
BS, Math, USN Academy, 1969
MS, Astrophysics, University of Colorado, 1970

PRESENT POSITION: Flight Controller/Payload Officer
Payload Operations Division
Johnson Space Center
Houston, Texas 77058

PARENTS: Mr. & Mrs. Percy J. Lounge of Burlington, Colorado

NAME: Jerry L. Ross, Captain, US Air Force

BIRTH DATE AND PLACE: 1-20-48 - Gary, Indiana

CURRENT RESIDENCE: Friendswood, Texas

EDUCATION: Crown Point High School, Crown Point, Indiana -
BS, Mechanical Engineering, Purdue University, 1970
MS, Mechanical Engineering, Purdue University, 1972

PRESENT POSITION: Flight Controller/Payload Officer
Payload Operations Division
Johnson Space Center
Houston, Texas 77058

PARENTS: Mr. & Mrs. Donald J. Ross of Crown Point, Indiana

NAME: Sherwood C. Spring, Major, US Army

BIRTH DATE AND PLACE: 9-3-44 - Hartford, Connecticut

CURRENT RESIDENCE: Camp Humphries, Korea

EDUCATION: Pongansett High School, Glocester, Rhode Island
BS, Engineering, US Military Academy, 1967
MS, Aero. Engineering, University of Arizona, 1974

PRESENT POSITION: Operations Officer
HHD, 19th Aviation Battalion Combat
Camp Humphries, Korea

PARENTS: Mr. & Mrs. Edward C. Spring of Stuart, Florida

NAME: Robert C. Springer, Major, US Marine Corps

BIRTH DATE AND PLACE: 5-21-42 - St. Louis, Missouri

CURRENT RESIDENCE: Virginia Beach, Virginia

EDUCATION: Ashland Senior High School, Ashland, Ohio
BS, Naval Science, USN Academy, 1964
MS, Operations Research, USN Postgraduate School, 1971

PRESENT POSITION: Force Requirements Officer
Headquarters, Fleet Marine Force, Atlantic
Norfolk, VA

PARENTS: Mr. & Mrs. Walter C. Springer of Ashland, Ohio

NAME:

BIRTH DATE AND PLACE:

CURRENT RESIDENCE:

EDUCATION:

PRESENT POSITION:

PARENTS:

NAME: John E. Blaha, LT. COL., US Air Force

BIRTH DATE AND PLACE: 8-26-42 - San Antonio, Texas

CURRENT RESIDENCE: Springfield, Virginia

EDUCATION: Granby High School, Norfolk, Virginia
BS, Astronautical Engineering, USAF Academy, 1965
MS, Astronautical Engineering, Purdue University, 1966

PRESENT POSITION: Director, Air Combat Effectiveness
Headquarters, U.S. Air Force
Washington, DC

PARENTS: Father: Elmer C. Blaha (deceased)
Mother: Frances E. Blaha of San Antonio, Texas

NAME: Charles F. Bolden, Jr., Major, US Marine Corps

BIRTH DATE AND PLACE: 8-19-46 - Columbia, South Carolina

CURRENT RESIDENCE: Great Mills, Maryland

EDUCATION: C. A. Johnson High School, Columbia, South Carolina
BS, Electrical Engineering, USN Academy, 1968
MS, Systems Management, University of Southern California, 1977

PRESENT POSITION: Test Pilot/Project Officer -
Naval Air Test Center
Patuxent River, MD 20670

PARENTS: Father: Charles F. Bolden, Sr. (deceased)
Mother: Ethel Martin Bolden of Columbia, South Carolina

NAME: Roy D. Bridges, Jr., Major, US Air Force

BIRTH DATE AND PLACE: 7-19-43 - Atlanta, Georgia

CURRENT RESIDENCE: Las Vegas, Nevada

EDUCATION: Gainesville High School, Gainesville, Georgia
BS, Engineering Science, USAF Academy, 1965
MS, Astronautics, Purdue University, 1966

PRESENT POSITION: Special Project Officer
HQ USAF
Nellis Air Force Base
Las Vegas, Nevada

PARENTS: Mr. & Mrs. Roy D. Bridges, Sr., Gainesville, Georgia

NAME: Guy S. Gardner, Major, US Air Force

BIRTH DATE AND PLACE: 1-6-48 - Altavista, Virginia

CURRENT RESIDENCE: Clark Air Force Base, Phillipines

EDUCATION: George Washington High School - Alexandria, Virginia
BS, Aeronautical Engineering, USAF Academy, 1969
MS, Aeronautical Engineering, Purdue University, 1970

PRESENT POSITION: Operations Officer
1st Test Squadron
Clark AFB, Phillipines

PARENTS: Father: Maxwell F. Gardner (deceased)
Mother: Worthy Spence Gardner of Alexandria, Virginia

NAME: Ronald J. Grabe, Major, US Air Force

BIRTH DATE AND PLACE: 6-13-45 - New York, New York

CURRENT RESIDENCE: Edwards AFB, California

EDUCATION: Stuyvesant High School, New York, New York
BS, Engineering Science, USAF Academy, 1966
MS, Aeronautics, Technische Hochschule, Darmstadt, Germany, 1967

PRESENT POSITION: Instructor Pilot
USAF Test Pilot School
Edwards Air Force Base, CA

PARENTS: Father: Hans H. Grabe (deceased)
Mother: Martha Langpap Grabe of Lakewood, New Jersey

NAME: Bryan D. O'Connor, Major, US Marine Corps

BIRTH DATE AND PLACE: 9-6-46 - Orange, California

CURRENT RESIDENCE: Washington, DC

EDUCATION: 29 Palms High School, 29 Palm, California
BS, Naval Science, USN Academy, 1968
MS, Aeronautical Systems, University of W. Florida, 1970

PRESENT POSITION: Harrier Class Desk Officer
Naval Air Systems Command
Washington, DC 20361

PARENTS: Mr. & Mrs. Thomas J. O'Connor of San Diego, California

NAME: Richard W. Richards, LT CMDR, US Navy

BIRTH DATE AND PLACE: 8-24-46 - Key West, Florida

CURRENT RESIDENCE: California, Maryland

EDUCATION: Riverview Gardens High School, St. Louis, Missouri
BS, Chemical Engineering, University of Missouri, 1969
MS, Aeronautical Systems, University of W. Florida, 1970

PRESENT POSITION: Test Pilot/Project Officer
Naval Air Test Center
Patuxent River, MD 20670

PARENTS: Mr. & Mrs. M. R. Richards of St. Louis, Missouri

NAME: Michael J. Smith, LT CMDR, US Navy

BIRTH DATE AND PLACE: 4-30-45 - Morehead, South Carolina

CURRENT RESIDENCE: Virginia Beach, Virginia

EDUCATION: Beaufort High School - Beaufort, North Carolina
BS, Aeronautical Engineering, USN Academy, 1967
MS, Aeronautical Engineering, USN Postgraduate School, 1968

PRESENT POSITION: Pilot and Maintenance Officer
Attack Squadron 75
NAS Oceana
USS Saratoga

PARENTS: Father: Robert L. Smith (deceased)
Mother: Lucile Safrit Smith (deceased)

NASA News

National Aeronautics and
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Lyndon B. Johnson Space Center
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AC 713. 483-5111

June 10

Terry White

For Release

RELEASE NO: 80-039

June 10, 1980

ALSO RELEASED AT NASA HEADQUARTERS

[See Apr. 22]

INVESTIGATORS FILE REPORT ON CAUSE OF SPACESUIT BACKPACK FIRE

A NASA board investigating the April 18 flash fire in a spacesuit backpack found where the fire started and recommended 11 ways to improve safety and reliability of the system.

While the exact cause was not found, the four most probable causes of ignition were cited in the board's report to Johnson Space Center Director Christopher C. Kraft, Jr., after five weeks of engineering detective work that included more than 2,000 unsuccessful attempts to reproduce the fire.

The accident destroyed an unoccupied Space Shuttle spacesuit and life support backpack. A Hamilton Standard technician, Robert A. Mayfield, was severely burned but is recovering and has been released from the hospital.

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These tests are conducted to assure that such malfunctions are discovered prior to flight, since such an accident during a mission might well cause serious injury or fatality, or require premature termination of the mission.

The fire apparently started when the technician switched the secondary oxygen pack to the "spacewalk" position during a performance test in a clean room in the Crew Systems Laboratory. The secondary pack is attached to the bottom of the main backpack and provides 30 minutes of emergency oxygen for breathing and to maintain suit pressure if the main oxygen source fails.

Ignition took place in a V-shaped passage which serves to restrict the flow of oxygen between a shut-off valve and a chamber in the pack's regulator module, the investigating board determined. It said the four most probable causes were:

1. Heating by compression or shock of a thin section of aluminum between the flow restrictor passage and the adjacent cavity.
2. Heating by compression or shock of contaminants in the flow restrictor.
3. Heating of internal surfaces through mechanical shock of incoming high-pressure oxygen, or heating of particles.
4. Similar heating of shut-off valve o-rings.

The board found that all procedures followed during the April 18 test were proper. The regulator module had 19 cycles with high-pressure oxygen prior to the accident.

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Technicians were unable to duplicate the failure in tests at Johnson's White Sands Test Facility, Las Cruces, New Mexico. Four regulator modules of the same factory batch were cycled 2,228 times. Post-test disassembly revealed significant contamination within the modules.

A regulator module is machined from a single block of aluminum and is fitted with valves, a pressure gauge and two step-down regulators that reduce oxygen supply pressure from 6,000 to 3.5 pounds per square inch. The flow restrictor consists of two 1/16-inch diameter drilled passages that intersect. It is between the high pressure inlet and the first stage regulator.

After ignition on April 18, the regulator module burned through and an oxygen-rich jet of flame burned the lower torso of the attached spacesuit.

The board ruled out backpack and clean room electrical systems as ignition sources. It said all clean room support feed lines were pure.

The 11 recommendations of the board are:

- ° Redesign high pressure oxygen valves and regulators so that debris cannot be trapped and eliminate "stagnation points" where heating by compression and shock can occur.

- ° Redesign regulator modules to lessen chance of internal contamination, while improving manufacturing inspection techniques.

- more -

- ° Review the design of all Space Shuttle high pressure valves and regulators for debris traps and unprotected o-rings.

- ° Replace existing silicone o-rings with silicone o-rings having improved ignition resistance.

- ° Machining regulator module body from monel instead of aluminum would reduce ignition potential.

- ° Inspect completed regulator modules with X-rays.

- ° Consider using neutron radiography to confirm that o-rings and other non-metallic components with significant hydrogen content are properly installed.

- ° Machine a dummy regulator module body from a block of clear plastic to verify wall thicknesses and other passageway machining tolerances.

- ° Consider comparison impact ignition testing of Teflon or Kel-F backup rings as a means of reducing shock heating of silicone o-rings.

- ° Clarify internal NASA specifications.

- ° Consider establishing a committee consisting of NASA and non-NASA personnel to collect existing high-pressure oxygen data, review and clarify existing design standards and requirements, recommend any necessary supplements to presently available information and publish a comprehensive standard for the design and use of high-pressure oxygen equipment used in the space program.

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The investigating board was headed by Chester A. Vaughan, propulsion engineer. Members were: Noel Willis, Jr., crew systems engineer; George D. Nelson, astronaut; Joseph Degioanni, flight surgeon; and James B. Chappée, safety engineer. Andrew J. Hoffman of Hamilton Standard served as ex-officio member, and R. L. Johnston, materials engineer, served as advisor.

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NASA News

June 27

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Kay Ebeling

For Release

RELEASE NO: 80-040

June 27, 1980

JOHNSON SPACE CENTER ENGINEERS STUDY

FUTURE SPACE CONSTRUCTION METHODS

Construction of large structures in space calls for innovations years in advance of the first project. Engineers at Johnson Space Center are working on automated methods to "space fabricate" structural beams and trusses in orbit to build space construction projects of the future.

A truss, much like one a "beam builder" in space would produce, recently arrived at JSC. Engineers here will run structural evaluation tests with it in early July. In these tests a hydraulic cylinder applies varying loads to the truss to test its stiffness and strength.

The test truss was made by General Dynamics-Convair Division and it is a product of three years' analysis, design, and testing of the automated fabrication approach to space construction.

- more -

A construction package the Space Shuttle carries into orbit must be lightweight and compact, yet able to carry materials with the strength and durability of a communications array or an antenna that remains in space for years, or the first beams for a structure that will house personnel in Earth orbit.

The beam builder being evaluated at JSC holds approximately 918 meters of graphite composite flat strip material rolled inside a storage canister. The roll turns on bearing-mounted rollers and unwinds uniformly. An access panel in the hinged half opens for the material to pass over the heating section guide rollers which form it into the required shape.

After forming, the material passes into the cooling section where aluminum platens cool one complete bay length of cap section during a 40-second pause. During the pause, crossmembers are ultrasonically welded in place to complete the truss.

Four friction rollers drive the material from the storage roll through the heating/forming/cooling sections and advance the beam out of the beam builder.

Methods other than space fabrication are also being studied at NASA. One approach is to make structures which can be folded into dense packages and stowed during launch, then deployed on-orbit into larger, lightweight space systems. Another approach is to use pre-fabricated, tapered tubular members and connectors which nest

- more -

inside each other as a package during launch and then are erected piece-by-piece in orbit into a large structure with the work of a remote manipulator or a suited crewmember.

Research into automated space beam building will continue at JSC over the next few years. The project is now in pre-development stages. In the next three to five years, JSC engineers hope to have a prototype flight machine at the space center for more specific development testing.

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Photos available: S80-35208 The Deployable Space Truss Beam

S80-35215 Beam fully deployed

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Lyn Cywanowicz

For Release

RELEASE NO: 80-042

June 27, 1980

JSC NAMES HARLAN TO SAFETY/QUALITY POST

Charles S. Harlan has been named acting deputy director for Safety, Reliability and Quality Assurance for NASA's Johnson Space Center effective July 7, 1980.

The SR&QA office sets policies and requirements for high standards of employee safety and equipment quality at JSC, and for space hardware quality at contract manufacturing plants.

Harlan joined NASA in June 1962, and has served as chief of the Payload Operations Division at JSC since November 1976. Earlier he was flight director for the Skylab Re-entry, and assistant flight director during the Apollo program.

He replaces William M. Bland, Jr. who retired from NASA in December 1979.

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Dave Alter

For Release

RELEASE NO: 80-052

Upon Receipt

SHUTTLE CREWMAN TO SEND LIVE PICTURES ON SPACEWALK

NASA television engineers at the Johnson Space Center in Houston are modifying an Air Force television camera for live, real-time TV transmission by crewmen taking spacewalks outside the Space Shuttle Orbiter.

Like a third eye or miner's light mounted in his forehead, the camera is positioned in the astronaut's extravehicular visor assembly. It protrudes from the visor, seeing what he sees and transmits black and white scenes back to a TV monitor for a crewman in the spacecraft. Also, it may transmit live back to Earth, or record on board for later replay.

What the astronaut sees, the TV camera transmits.

He may be inspecting the glass-tile heatshield, or choose to view the latches, doors, or payloads.

The camera system allows the crewman inside to view the hardware and spacewalk activity while it happens, making joint decisions on repairs.

- more -

Three TV camera systems are being purchased: one for flight, a second for training and a third for testing, qualification and future use.

The camera system includes a battery pack, FM transmitter, antenna, and receiver in the Orbiter, along with other supporting hardware.

Cost of the three complete TV-camera systems including integration, testing and mission planning is estimated at \$750,000.

"This program will mark initial use of a solid state image sensor instead of vacuum tube," said Bernard C. Embrey, Jr., subsystem manager, Extravehicular Mobility Unit television.

Here is how the Space Shuttle Orbiter space television system works:

An astronaut dons his pressure suit, officially termed the Extravehicular Mobility Unit (EMU), and backpack with a portable life support system (PLSS), capable of supplying seven hours of oxygen. He then enters the payload bay through an airlock, where he hooks up to the Manned Maneuvering Unit (MMU) and moves laterally to the work platform. Powered by jets of nitrogen gas, the crewman taxis the station to inspect and photograph the Orbiter.

The camera's wide angle lens provides a 19.7 mm focal length with a 32 degree horizontal field-of-view. The lens range will be preset to keep the scenes in focus from about 15 inches to whatever distance is required.

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September 2, 1980

NASA-JSC

NASA News

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Terry White

For Release

RELEASE NO: 80-053

August 27, 1980

ALSO RELEASED AT NASA HEADQUARTERS

ENGINEERING AND OPERATIONS SUPPORT CONTRACT AWARDED

NASA has selected McDonnell Douglas Technical Services Co., Inc. (MDTSCO), Houston, for negotiations leading to the award of a cost-plus-award-fee contract for performance of Space Transportation Systems Engineering and Operations Support.

The contract will be for technical and analytical support in the areas of engineering systems analyses, flight design, flight operations and management systems support.

The period of performance of this effort will be from October 1980 through September 1986, and will be divided into three equal contract increments. The contractor's estimated cost for the first two-year increment plus a firm two-year option is approximately \$25 million.

The contract will be under the management and technical direction of the Lyndon B. Johnson Space Center, Houston, Texas. Lockheed Engineering and Management Services, Houston, also submitted a proposal for the work.

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NASA-JSC

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Oct 1*

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For Release

RELEASE NO: 80-057

October 1, 1980

ASTRONAUT GIBSON LEAVES NASA TO JOIN TRW

Scientist-astronaut Dr. Edward G. Gibson will leave the NASA Johnson Space Center effective October 31 to join TRW Defense and Space Systems Group, Redondo Beach, CA as advanced systems manager.

Gibson was selected as an astronaut in June 1965 and was science pilot on the 84-day Skylab 4 mission in 1973-1974. An eminent scientist in the field of solar physics, Gibson is author of the textbook, The Quiet Sun.

He left NASA in 1974 to join Aerospace Corporation as senior staff scientist, and later was consultant to the West German aerospace firm of ERNO Raumfahrttechnik GmbH in Bremen. Gibson rejoined NASA in March 1977

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Dave Alter

For Release

RELEASE NO: 80-065

Immediate

NASA ANNOUNCES NEW FIRE RESISTANT MATERIAL FOR AIRCRAFT

A spongy, light-weight material that resists ignition up to 800 degrees fahrenheit and even then only chars and decomposes, has been developed for NASA's Johnson Space Center in Houston, safety experts said here .

The new, flame-resistant material, named "polyimide resilient foam," could reduce in-flight fires and lengthen airline passenger evacuation time from two to five minutes for a survivable crash complicated by an external fuel fire.

Accident statistics given the House of Representatives 96th Congress in 1979 showed that from 1969 through 1978, there were 16 survivable crashes in which 419 passengers (22 percent) died in fires. This was 68.5 percent more than the 287 who died during impact in the same crashes. The data was presented in hearings before the subcommittee on oversight and review of the Committee of Public Works and Transportation.

December 11, 1980

-more-

Four polyimide double seats will be supplied for test and evaluation by the FAA in a C-133 aircraft at its technical center in Atlantic City, NJ.

Polyimide foam is being suggested as a replacement for polyurethane used in aircraft seat cushions, which represent the largest amount of flammable material in airline interiors. Since the new polyimide does not outgas until it begins to char at the approximate 800 degree temperature, it is safer from toxic fumes produced by polyurethane at ignition.

It is not only safer, say NASA fire safety experts, but also provides an estimated 50 percent weight savings.

By varying the ingredients of polyimide, the material hardens and can be used as light-weight wallboard or high-strength rigid floor panels while retaining its fire resistance. As thermal-acoustical insulation with polyimide foam, wallboard could act as thermal or fire barriers, reducing the cabin interior heat load and preventing other flammable materials from igniting.

Manufacturers of commercial aircraft and airline companies have sought improved fire-resistant materials since the early 1960's. By the late 1960's, NASA had developed some fire-resistant materials for the Apollo spacecraft and Skylab vehicle.

The Technology Utilization Office at NASA in Washington recommended these materials be made available to the public, particularly the aircraft industry, which failed to adopt them because they lacked durability, were not commercially available and cost too much to produce. Further development in the Technology Utilization program effort resulted in development of polyimide resilient foam, produced for NASA by the Solar Division of International Harvester, San Diego.

Original formulation of polyimide resilient foam was developed by International Harvester, which holds the patents. Limited production is to begin next year.

Once in production, polyimide foam also could provide extra safety for surface transportation including school buses, trains and automobiles, NASA fire experts said.

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